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# TRAVELS IN BRITISH EAST AFRICA
## ZANZIBAR AND PEMBA

W. W. A. Fitz Gerald

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# TRAVELS IN THE COASTLANDS

OF

# BRITISH EAST AFRICA

AND THE ISLANDS

OF

# ZANZIBAR AND PEMBA

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# TRAVELS IN THE COASTLANDS

OF

# BRITISH EAST AFRICA

AND THE ISLANDS

OF

# ZANZIBAR AND PEMBA

THEIR AGRICULTURAL RESOURCES AND
GENERAL CHARACTERISTICS

BY

WILLIAM WALTER AUGUSTINE FITZGERALD

FELLOW ROYAL GEOGRAPHICAL SOCIETY, FELLOW ROYAL COLONIAL INSTITUTE

*WITH MAPS, ILLUSTRATIONS, AND APPENDICES*

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1898

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To

# SIR JOHN KIRK,

G.C.M.G.,

GOLD MEDALLIST OF THE ROYAL GEOGRAPHICAL SOCIETY, 1882,

LATE H. M. CONSUL-GENERAL AT ZANZIBAR,

BRITISH PLENIPOTENTIARY, INTERNATIONAL SLAVERY CONFERENCE, 1889,

MEMBER OF THE UGANDA RAILWAY COMMITTEE,

WHO HAS DONE SO MUCH TO DEVELOP THE COMMERCIAL RESOURCES OF BRITISH EAST AFRICA BY THE DISCOVERY OF MANY USEFUL PLANTS AND PRODUCTS,

AND WHOSE WRITINGS HAVE SUPPLIED MUCH VALUABLE INFORMATION FOR THIS WORK,

WHICH OWES ITS EXISTENCE TO HIS ENCOURAGEMENT,

THE FOLLOWING PAGES ARE, WITH VERY SINCERE REGARD, INSCRIBED.

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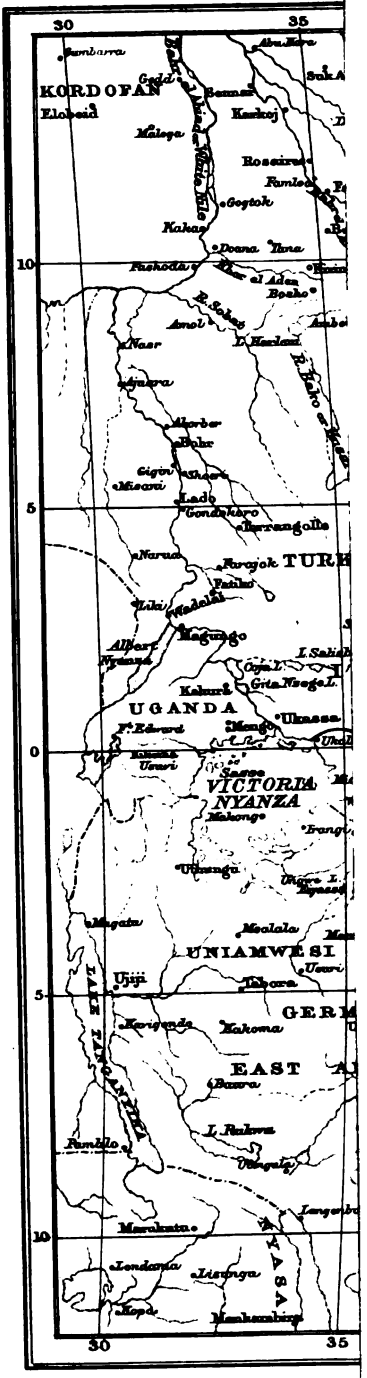


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# PREFACE

THE following pages record the result of my two years' explorations of the British East African coast-lands, while specially employed to report on their agricultural capabilities by the Directors of the late Imperial British East Africa Company.

Since my return in 1893, I have strongly desired to bring into public notice the great capabilities of this still comparatively unknown portion of our East African Empire.

In the anxious search for new markets, caused by the Trade rivalry of the present day, the fact is not sufficiently realized that, along the 400 miles of sea-board within our sphere, there exists a wonderfully fertile country only awaiting the advent of English energy, capital, and enterprise for its development, and the exploitation of such products as Rubber, Cotton, Ivory, Copal, Jute, Fibres, Hides, Cereals, Oil-seeds, Copra, etc., while the forests contain many valuable woods. The climate varies from tropical on the Coast-lands to bracing, frosty, and cold on the high inland plateaux.

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I have entered very fully into the matter of soils and commercial products, hoping this book will prove of real use for reference to future settlers, whilst still affording some matter of interest to the general reader.

England owes a debt of gratitude to the Imperial British East Africa Company, to whose pioneer work and efforts we owe the possession not only of this fertile country, but of Uganda itself, and whose advent brought "Light and Liberty" to the native and the slave.

The portion dealing with Zanzibar and Pemba is an enlargement of my report 'On the Spice and other Cultivation of Zanzibar and Pemba Islands,' *Foreign Office Miscellaneous Series*, No. 266, 1892.

My acknowledgments and thanks are due to H. M. Under Secretary of State for India, for kind permission to republish Mr. Robert Cross's 'Reports on the American Rubber Trees,' a permission rendered doubly valuable by the fact that they are now out of print.

To the Controller of H. M. Stationery Office, and Mr. Thistleton Dyer, Director, Royal Gardens, Kew, for allowing the use of notes and extracts from the various *Kew Bulletins*, the number dealing with 'Bowstring Hemp' being also out of print. To Sir Arnold Kemball, K.C.S.I., K.C.B., the Chairman, and other Directors of the late Imperial British East Africa Company, for placing at my disposal many valuable documents and reports.

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To Mr. P. L. McDermott, late Secretary of the same, for his help and assistance.

To Mr. Ernest G. Ravenstein, F.R.M.S., Chairman of the British Association Committee on the Climatology of Africa, for the valuable meteorological and climatological returns courteously placed at my disposal.

To the Rev. W. E. Taylor, C.M.S., Mombasa; Mr. John Christie, of Messrs. Ide and Christie; the editor of *The Times*, and others, for kind permission to use extracts.

To Mr. E. Heawood, M.A., of the staff of the R.G.S., for his kind aid in revising this work for the press.

My thanks are also due to Mr. E. A. Reeves, Assistant Map Curator, R.G.S., for his careful and excellent preparation of the maps from my bearings, sketches, and notes.

W. W. A. FitzGerald.

*January 1898.*
*Carrigoran,*
*Newmarket-on-Fergus,*
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# CONTENTS

## PART I.—THE MAINLAND

### INTRODUCTION

#### THE COAST-LANDS OF BRITISH EAST AFRICA

PAGE

General Appearance—Vegetation—Rivers and Harbours—Rain-fall—Prevailing Winds—Temperature—Relative Humidity—Population . . . . . 1

### CHAPTER I

#### ARRIVAL IN AFRICA—JOURNEY TO THE MAGARINI SHAMBAS

Landing at Mombasa—Scope of my Mission—Departure for Melindi—Interviews with the Liwalis of Melindi and Mombrui—Ground Cultivation, Coco-nuts—Start for Shambas—Sabaki River—Mombrui—First Night in a Slave Village—Native System of Agriculture—Labour Question—Cotton—The Wanika—Scarcity of Water Supply—The African Slave . . . . . 12

### CHAPTER II

#### LIFE AT MAGARINI

Friendliness of the Liwalis—Nasur bin Suliman's Shambas—Charming Country—Commissariat Troubles—Choice of Headquarters—Silence of the African Night—Shambas under my Supervision—Luxuriant Vegetation—Proposed Improvements—My Native Staff—Engagement of Head-man—M'Doro the Nika Head-man—Native Path to Melindi—The Jorori River—A Ducking—Dum Palms—Native Clearings—Suitability of the Soil for Cotton—Ferry over the Sabaki—A Primitive Bridge—Return to the Shambas . . . . . 33

### CHAPTER III

#### FIRST EXPERIENCES ON AN EAST AFRICAN SHAMBA

Preliminary Troubles—Incendiarism—A Refractory Native—A "Shauri"—An Encouraging Change—A Valuable Ally—My Wanika Labourers—Agricultural Seasons—Seed-time and Harvest—Various Products—A Large Muster—Daily Routine—Harvesting Bananas—Natives' Dislike of Rain—A Reformed Character—Visits of Inspection—Site for Experimental Nurseries—A Good Start—Proposed Tour up the Sabaki—Preliminary Arrangements—Final Instructions—Personnel of my Party—First Night in Camp . . . . . 52

Digitized by Google

## CHAPTER IV

GONGONI, RAS N'GOMANI, AND THE ORCHELLA WEED DISTRICT OF MARERENI

PAGE

A Polite Head-man—Cultivation—Rapid Growth of Silk-cotton Tree—Guniah System of Agriculture—A Primitive Telephone—Salt Deposits—A Sandy Waste—Scarcity of Firewood—Ras N'Gomani Fisher-folk—Shark's Flesh as Food—Abundance of Game—Mangrove Timber—Waiting for Canoes—Bad Marksmen—Shallow Back-waters—Casuarina Trees—Flat Grass Plains—Marereni—Orchella Weed—Great Heat—Elephant Tracks—Rich Soil—Back to Mombrui . . . . . 73

## CHAPTER V

JELORI—THE GIRYAMA TRIBE

Arab Hospitality—Shamba Accounts—Proceed to Melindi—Stalking a Turtle—Preparations for Sabaki Expedition—Start for Jelori—Fertile Country—Large Coco-nut Plantations—Mr. Weaver's Road—Sekoki Hill—The Sabaki—Lake Jelori—C. M. S. Station, Mr. and Mrs. Hooper—Exploration of the Lake—Giryama Villages—Sansevieria Fibre—A Hippopotamus Hunt—Village in the Forest—Shauri with the Wa-Giryama—Canoeing after Hippo—The Wa-Giryama and their Country . . . . . 85

## CHAPTER VI

THE SOUTH SIDE OF THE SABAKI RIVER

Leave for Merikano—Useless Head-men—Difficult Marching—A Land of Swamps—"M'Lengo-Baya"—First Sight of Wa-Galla—The Watoro—Camps in the Forest—Hyphæne Palm Toddy—Watoro Cultivation—Makongeni Stockade—The Runaway-slave Settlements—Reception by the Watoro—Trouble with my Askaris and Wanika—Cowardice of Old Jubah—Exploration up the River—Lost in the Bush—A Proud Cook—"Roughing it"—Back to Makongeni . . . . . 116

## CHAPTER VII

MAKONGENI TO TAKAUNGU *viâ* FULADOYO—THE GIRYAMA COUNTRY

The Journey to the Coast—Vicissitudes of Native Family Life—Slave Traffic amongst the Native Tribes—Thorny Jungles—Mangea Hill—Heat and Thirst—An Old Camp of Lugard's—Collapse of the Wanika—The White Man an Object of Curiosity—Masai Raids—Agriculture among the Wa-Giryama—Extensive Forests—Fuladoyo—Town of M'Tanganiko—Wanika Settlers—The Liwali of Takaungu—Indiarubber Vines—Arrive at Takaungu . . . . . 130

Digitized by Google

## CHAPTER VIII

TAKAUNGU—ROKA—M'SHAKA IN THE INDIARUBBER DISTRICT

PAGE

Takaungu and its Chief Products—A Drunken Brawl—M'Narani—Kilifi Bay—Cross to M'Tondoa—Wild Cotton—Thick Forest—Roka—Coral Rock—M'Shaka—Among the Rubber Vines—Method and Time of Collecting—The East African Rubber Trade . . . . . 141

## CHAPTER IX

GUM-COPAL TREES—AROBOKO TO MELINDI—SEARCHING FOR A SLAVE CARAVAN

Gum-copal Trees—Aroboko—A Well-cultivated Valley—Wasania Village—Return to Melindi—Pay off my Men—Untrustworthiness of Ali bin Jumah—Small Troubles—News of a Slave Caravan—Once more on the March—The North Bank of the Sabaki—The Wakamba Tribe—Guarding the Roads—River Fords—A Trackless Wilderness—Arbagundi—Camping under Difficulties—Native Simplicity—The Wa-Galla—Insect Plagues—Crocodile and Hippo Lakes—A Village Fire—Snakes—Back to Jelori . . 153

## CHAPTER X

A THREATENED RAID—MY EXPEDITION TO NO. 2 STOCKADE

A New Commission—Grateful Arab Ladies—Ali bin Jumah—Departure for No. 2 Stockade—The "Siafu" Ant—An Exciting Report—A Hurried Return—Organize a Reconnoitring Party—Native Allies—A False Alarm—A New Start—Oppressive Heat—Centipedes and Scorpions—Troubles with the Watoro—Our Plans—The North-east Rains—March up the Sabaki—Thick Forest—The Sabaki River—Camp in the Bush—Masai War-paths—Difficult Progress—Characteristics of the Country—Game Tracks—Reach the Stockade at last . . . . . 174

## CHAPTER XI

AT NO. 2 STOCKADE ON THE SABAKI RIVER

At Work on the Stockade—Climate—The Return Journey—The Sabaki in Flood—Weaver's Road—A Flooded Country—Makongeni again—Damp Quarters—Mosquitoes—Back to the Stockade—Lions—Carrying up the Stores—Meet Mr. Foaker—M'Soma and the Arabs—A Memorable Christmas—Tobacco and Castor-oil Plants—Illness of Weaver—Sabaki Flies—Arrival of the Survey Caravan—Unwonted Luxuries—Runaway Porters—A Long March—An Offer to the Watoro—Giryama Customs—The End of my Expedition . . . . . 190

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## CHAPTER XII

SUGGESTIONS FOR THE DEVELOPMENT OF THE COAST-LANDS AND SABAKI DISTRICT

PAGE

Fertility of the Country—The Coast-lands—Declining Cultivation—The Labour Question—Tamul Coolies—Ploughs and Draught Animals—Products—Cotton—Coco-nuts—Bananas—Silk-cotton Trees—Mangrove Timber—The Sabaki as a Water-way—Irrigation—Timber—Indiarubber: the various species—Nutmegs and Cacao—Castor-oil—Fibre-producing Plants (*Sansevierias*)—Prices of Fibres—Ramie Grass—Pineapples . . . . . 204

## CHAPTER XIII

MAGARINI—JOURNEY TO MOMBASA, *viâ* ROKA AND KONJORA

Cotton—Acting as Arbiter—The Watoro Register—Start for Mombasa—The Hot Season—Roka—Brackish Soils—Konjora and its Creeks—M'Tanganiko—Kilifi Creek—Experiences on Board a Dhow—Visits to Zanzibar and Pemba . . . . . 237

## CHAPTER XIV

SHAMBA LIFE—JOURNEY TO MOMBASA AND BACK

An Unpleasant Voyage—Mr. Weaver becomes my Assistant—The Wet Season—Rain-gauge—Shipment of Copra—Transport Questions—Rats and Snakes—Revisit Jelori—Change in the Attitude of the Watoro—Somali Children—A Hard March—Lions—Watamu—The N'Zovoni River—Meet Bishop Tucker at Frere Town—Mombasa again—Rabai Mission Station—Through the Giryama Country—An Enthusiastic Reception . . . . . 252

## CHAPTER XV

LAKE KRAWA

Nubian Labourers—Proposed Visit of Sir Gerald Portal—Start to explore Lake Krawa—Arab Shikaries—My Caravan Astray—A Long Fast—Oil Palms—Lake Krawa and the Kilifi River—Game—Mosquitoes—Reconnoitring the Country—Return to the Shambas—Scarcity of Grain—Disinterested Arabs—Flooded Back-waters—Dead Beat—Sir Gerald Portal's Mission to Uganda—A Shooting Party—A Lion Story—Christmas at Mombasa—A Wretched New Year's Day—Fever—Mango Crop—Mr. Weaver's Work at the Shambas . . . . . 295

## CHAPTER XVI

JOURNEY FROM MOMBRUI TO THE TANA RIVER *viâ* GONGONI, MARERENI, AND LAKE KRAWA

My Expedition—The Coast-lands north of Mombrui—Scarcity of Water—Dwarf Palms—Marereni—Changes since my last Visit—An Uncultivated Wilderness—Water-holes—Euphorbias—Back-waters—Simba Hill—Possibilities of Cultivation—Galla Path—Lake Krawa—The Tana Valley—Galla Village—Golbanti 310

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## CHAPTER XVII

### THE TANA RIVER AND COUNTRY

PAGE

Golbanti Mission Station—The Wa-Pokomo—Lakes of the Tana Valley—Golbanti and surrounding Country—Lake Ashakababo—Native Method of extracting Aloe Fibre—Luxuriant Maize—Flat Country—The Tana—N'Gao—German Mission—Winding Nature of the River—The Country to the South-west—Lake Burabin—Mr. Bird-Thompson on the Tana and its Tribes. . . 323

## CHAPTER XVIII

### GOLBANTI TO WITU

Journey down the River—The Belesoni Canal—The Tana Swamps—Kalota River—Kisanga Wells—The Ozi River—Kau—Camping in a Graveyard—Crocodiles—Kirimanda River—"M'To Mombamba"—March to Witu—European Officers at Witu—The Rebel Sultan—Salt Lake—The Cattle Disease—A Loyal Native Gentleman—The Witu Country . . . . . 339

## CHAPTER XIX

### THE WITU DISTRICT—WITU TO KIPINI

The Utwani Forest—Disturbed State of the Country—The English Expedition of 1890—The Tsetse Fly—Start for Shaga—Lake Chakamba—A German Settler's Cotton Plantation . . . . . 352

## CHAPTER XX

### KIPINI TO LAMU—PATTA ISLAND

Kipini—The Ozi River—Camp at U'Kanga—Makombagni—Lake M'Pekatoni—Hindi—Bomani—A Flat Country—Fungu Zombo—Sivatoni—Arura—Wild Cotton—M'Kumbi—Return to the Coast—M'Kanumbi—March to Makowé—Lamu Island—Arrive at Patta Island—The Bajoni—Coir Fibre—The Wa-Siyu, Patta—Difficulty in getting away—Grasping Natives . . . . 366

## CHAPTER XXI

### FROM PATTA ISLAND TO LAMU AND MOMBASA

Off to Itembe—Mze Saif the Bajoni Chief—Hostile Attitude of the Wa-Siyu—Mattaroni—Bajoni Cotton Cultivation—Native Elephant-hunter—His Description of the Unknown Country—The Rainy Season—Renewed Difficulty in getting away—Sail for Wange—Round the Mongoni Creek—The Pokomoni River—An Arduous Day's March—Tangave—M'Gini—Lake Béré Béré—Lamu—A Long Overland Tramp—A New Experience—Magarini once more—Mombasa . . . . . 390



Digitized by Google

## CHAPTER XXII

EXPEDITION TO PORT DURNFORD

PAGE

A Tedious Delay—A Lion Hunt—Off at last—Organizing my Caravan—German Plantation at Wange—Development of the Country—The Ganda Fly—Indiarubber—A Fine Rice Country—Native Cotton—The Dodori Creek—A Gadfly—The Dodori River—A Lovely Country—The Mundane Hills—Vaas—A Flooded Land—Camping in the Rainy Season—An Important Conference . . . . . 415

## CHAPTER XXIII

JOURNEY TO PORT DURNFORD, *continued*—START FOR THE INTERIOR

To Parts Unknown—Bajoni Villages—Rubu—Mohamed bin Saif—Cotton Cultivation—Homwé—A Unique Event—Difficult Marching—Kionga—An Object of Curiosity—Shakan—An Unexpected Delay—Ras Kiambone Wells—Ancient Ruins—Gomé la Hekwa—A Rocky Coast—The Cape of the Pillar—An Alarming Report—Shakalasia—The Dhow Ashore—Port Durnford—Shauris with the Natives—I march Inland . . . . . 431

## CHAPTER XXIV

SEARCH FOR THE FOREST

Into the Bush—Cutting our Way—Orchella-weed—Warkono—An Elephant Haunt—Buramanza Hill—Makundu Ridge—A Useless Guide—An ever-receding Forest—Fever—A Shauri with the Guides—Stalking a Leopard—Burkau again—Deceit of Headman—Resolve to fall back—The Wa-Galla Settlements on the Wiori River—A Declining Race—Good-bye to Port Durnford—Shamku—Thirst—A Weary Night March—Return to Kionga—Engage another Guide—My New Plans . . . . . 455

## CHAPTER XXV

SECOND ATTEMPT TO REACH THE FOREST

Renewed start Inland—Niambwé Village—Camp in Bajoni Plantation—Breaking the "Charm"—Watiku Agriculture—The Wa-Boni Country—Watiku Intrigues—Soldier Ants—Mohamed reappears—Forest at last—Indiarubber Vines—Gleaning Information—Rain and Swamps—The Dodori River—Disquieting News—An Armed Force—Untrustworthy Guides—Fumo Omari—A Retreat decided on—A Caravan of Indiarubber Collectors—A Satisfactory Bargain—Illness—Kind Friends—My Faithful Dumgu—Loyalty of my Porters—Homeward Bound . . . . 474

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## PART II.—ZANZIBAR AND PEMBA

### CHAPTER I

GENERAL DESCRIPTION AND CLIMATOLOGY OF ZANZIBAR

PAGE

In search of an Hotel—Sir Lloyd Mathews—Interview with the Sultan—Kinabuni Garden—Sketch of Zanzibar Island—Position—Structure and Soil—Rain-fall and Temperature—My Plans . 505

### CHAPTER II

CHUENI—KOKOTONI AND SURROUNDING COUNTRY

Luxuriant Verdure—Chueni Palace—Clove Plantations—Country round Chueni—Neglected Shambas—Kokotoni—Mr. Fraser's Experiments: Sugar-cane and Coco-nuts—A Charming View—Scarcity of Labour—Salim bin Hamisi and his Estates—Character of Kokotoni District . . . . . 515

### CHAPTER III

KOKOTONI TO DUNGA

Continuous Clove Plantations—Arab Residences—Streams and Ridges—M'Do—A Neglected Property—Mwera Valley—M'Zingam Plain—Dunga . . . . . 529

### CHAPTER IV

THE WAHADINU COUNTRY—RETURN TO ZANZIBAR

Handsome Stone House—Dunga Hill—Visit to the Wahadinu Country—Coral-strewn Plains—Return Westward—Cassava Fields—An Underground Stream—Zanzibar again—Sir John Kirk's Garden at Mbweni . . . . . 538

### CHAPTER V

CULTIVATION AND AGRICULTURE IN ZANZIBAR

Cultivated Products—The Labour Question—Desirability of Indian Immigration—Need of English Capital—Agricultural Capabilities of the Island . . . . . 547

### CHAPTER VI

CLOVE CULTIVATION IN ZANZIBAR

Importance of the Clove—Its Introduction into Zanzibar—Method of Cultivation—Enemies of the Clove—Yield of Trees—Export—Necessary Reforms . . . . . 553

Digitized by Google

## CHAPTER VII

### OTHER PRODUCTS OF ZANZIBAR

PAGE

The Coco-nut and its Products—Betel-nuts and Betel Pepper—Mango and other Fruit Trees—Alimentary Plants—Banana Fibre—Grains—Ground-nuts—Chillies—Dyes—Domestic Animals in Zanzibar . . . . . 564

## CHAPTER VIII

### NEW PRODUCTS SUITABLE FOR CULTIVATION IN ZANZIBAR

Fibres—Cacao—Nutmegs—Cinnamon—Pimento—Pepper Vine—Ginger . . . . . 576

## CHAPTER IX

### TOUR IN PEMBA ISLAND

Points needing Investigation—Arrival at Weti—Arab Name for the Island—Exuberance of the Vegetation—An Arab Proprietor—Undulating Country—Uncleaned Ground—Fine Clove Trees—Narrow Creeks—Mohamed bin Jumah and his Shambas—Coffee Trees . . . . . 587

## CHAPTER X

### TOUR IN PEMBA ISLAND—*continued*

The Sea-shore near Weti—Cross Weti Creek—Coco-nut Groves—Extensive Cultivation—Cassava—A Considerable River—Drenching Rain—Witchcraft—Wild Vanilla—Swampy Valleys—Hilly Country—Great Extent of Clove Shambas—Need of Drainage—Complete my Inspection . . . . . 596

## CHAPTER XI

### AGRICULTURE IN PEMBA ISLAND

Clove Cultivation in Pemba—Nutmegs—Copra Drying—Rich Soil of the Island—The Labour Question—Scarcity of Capital . . 606

## APPENDICES

A.—FURTHER INFORMATION RESPECTING THE WA-GIRYAMA . . 615

B.—REPORTS AND VALUATIONS ON EAST AFRICAN PRODUCTS . 624

C.—METEOROLOGY OF BRITISH EAST AFRICA . . . . . 656

D.—NOTES ON AMERICAN RUBBER-PRODUCING TREES . . . . 678

E.—EXTRACTS RELATING TO FIBRE-PLANTS . . . . . 707

F.—SIR JOHN KIRK'S GARDEN AT ZANZIBAR . . . . . 726

G.—THE CLOVE TREE . . . . . 731

BIBLIOGRAPHY OF AUTHORITIES REFERRED TO . . . . . 737

INDEX . . . . . 741

Digitized by Google

# LIST OF ILLUSTRATIONS


| | PAGE |
|---|---|
| PORTRAIT OF THE AUTHOR (*Frontispiece*) | |
| THE BAOBAB TREE | 3 |
| PORT DURNFORD ESTUARY | 5 |
| KILINDINI HARBOUR | 6 |
| LANDING-PLACE, MOMBASA | 13 |
| DISTRICT OFFICER'S HOUSE, MELINDI | 14 |
| SAID BIN HAMID, LIWALI OF MELINDI | 15 |
| VASCO DA GAMA'S PILLAR, MELINDI | 16 |
| MOMBRUI | 19 |
| NATIVE VILLAGE—SHAMBA M'PANDIANI | 21 |
| A WANIKA HEAD-MAN | 25 |
| WANIKA VILLAGE | 27 |
| WANIKA WOMEN | 29 |
| EAST AFRICAN SLAVES | 31 |
| FREED SLAVES—MAGARINI PLANTATIONS | 37 |
| A WANIKA HUT | 45 |
| VIEW FROM MAGARINI HILL—LOOKING SEAWARDS | 49 |
| ALI BIN SALIM, LIWALI OF MOMBRUI, AND HIS BROTHER-IN-LAW | 55 |
| COCO-NUT TREE | 58 |
| BETEL-NUT PALMS | 61 |
| PRINCIPAL FRUITS AND FOOD STUFFS OF THE COAST-LANDS | 65 |
| WANIKA LABOURERS | 66 |
| NATIVE AGRICULTURE: THRESHING AND WINNOWING METAMAH | 75, 79 |
| A GIRYAMA VILLAGE | 95 |
| WA-GIRYAMA | 100 |
| WA-DIGO | 102 |
| WA-GIRYAMA WOMEN | 112 |
| WA-GIRYAMA | 134 |
| A WA-GIRYAMA FAMILY | 135 |
| NATIVES OF M'TANGANIKO | 138 |


Digitized by Google

PAGE

SWAHILI WOMEN . . . . . 142
NATIVE SHAMBA, M'TONDOA . . . . . 148
WATCHING THE WHITE MAN PASS . . . . . 159
WAKAMBA—NORTH BANK OF THE SABAKI . . . . . 163
VILLAGE GATEWAY—NORTH BANK OF THE SABAKI . . . . . 167
THE THREATENED RAID—ON OUR WAY TO JELORI, NEWS ON THE ROAD 181
A DEAD BABOON . . . . . 197
COCO-NUT TREES IN THE MELINDI DISTRICT . . . . . 205
COTTON STORE SHED—MAGARINI PLANTATIONS . . . . . 210
SEA ISLAND COTTON PLANTATION—MAGARINI PLANTATIONS . . . . 211
COCO-NUT GROVE—MAGARINI PLANTATIONS . . . . . 215
BREAKING COCO-NUTS FOR COPRA—MAGARINI PLANTATIONS . . . 217, 219
VIEW FROM MAGARINI HILL . . . . . 223
VIEW FROM MAGARINI HILL, LOOKING INLAND . . . . . 231
CAMP IN SHAMBA ABEDI—MAGARINI PLANTATIONS . . . . . 239
WANIKA VILLAGE, NEAR MAGARINI . . . . . 241
NATIVE LABOUR—FREED SLAVE WOMEN—MAGARINI PLANTATIONS . . 245
CAMP-SHED, SHAMBA BARAKA—MAGARINI PLANTATIONS . . . . . 253
COTTON FIELD—MAGARINI PLANTATIONS . . . . . 256
MORNING MUSTER—MAGARINI PLANTATIONS . . . . . 257
BREAKING COCO-NUTS FOR COPRA—MAGARINI PLANTATIONS . . . . 261
DRYING COPRA—MAGARINI PLANTATIONS . . . . . 265
EAST AFRICAN CAMELS . . . . . 269
MR. WEAVER'S HUT—MAGARINI . . . . . 271
A "SHAURI" WITH WA-GIRYAMA AND WAKAMBA CHIEFS AT JELORI . 275
RECEIVING A WANIKA DEPUTATION AT MY CAMP-SHED IN SHAMBA NGHANIMA . . . . . 279
A NATIVE DANCE . . . . . 283
FRERE TOWN BAY . . . . . 286
NATIVE VILLAGE . . . . . 289
ARRIVAL OF THE NUBIANS AT MAGARINI . . . . . 293
MY HEAD-MAN DUMGU . . . . . 297
SENDING ESTATE PRODUCE TO THE COAST . . . . . 301
ARAB DHOWS—MOMBASA HARBOUR . . . . . 305
MORNING MUSTER—MAGARINI . . . . . 307
PAY-TIME—MAGARINI PLANTATIONS . . . . . 311
EAST AFRICAN CAMELS . . . . . 315
THE FIRST PLOUGH USED ON THE COAST—MAGARINI PLANTATIONS . . 319
THE TSETSE FLY . . . . . 356
MAGNIFIED PROBOSCIS OF TSETSE FLY . . . . . 357
LEAF OF WILD COTTON PLANT GROWING IN THE VILLAGE OF ARURA . 372
BORASSUS PALMS . . . . . 374
LAMU FORT . . . . . 379

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PAGE

LAMU MARKET . . . . . 406
AFTERNOON TEA AT MAGARINI . . . . . 409
THE ADMINISTRATOR'S HOUSE AT KILINDINI—MOMBASA . . . . . 411
MY LAST GLIMPSE OF MAGARINI PLANTATIONS—PEACE AND PROSPERITY 413
MARKET STREET, MOMBASA . . . . . 416
A STREET IN LAMU . . . . . 417
MY PORTERS . . . . . 420
MY PORTERS—A HALT ON THE WAY . . . . . 426
CAMP AT ITEMBE . . . . . 428
SHWÉ . . . . . 432
RUBU . . . . . 433
MOHAMED BIN SAIF . . . . . 434
KIONGA BAY . . . . . 438
KIONGA . . . . . 440
HIGH STONE PILLAR, NORTH OF RAS KIAMBONE . . . . . 443
MY CARAVAN ON THE MARCH TO PORT DURNFORD . . . . . 445
CAMP AT SHAKALASIA . . . . . 447
FIRST VIEW OF PORT DURNFORD ESTUARY . . . . . 449
CAMP AT BURKAU . . . . . 450
PORT DURNFORD . . . . . 452
INTO THE BUSH . . . . . 453
BURAMANZA HILL . . . . . 456
OUR PATH THROUGH THE BUSH . . . . . 458
LAST DAY'S CAMP IN THE BUSH . . . . . 459
TYPE OF LARGER TREE GROWING IN THE INTERIOR . . . . . 461
CAMP AT BURKAU . . . . . 464
CAMP AT SHAMKU . . . . . 468
KIONGA—PORTERS WAITING FOR THE ORDER TO START . . . . . 475
CAMP IN MOHAMED BIN SAIF'S METAMAH SHAMBA . . . . . 477
SHAURI WITH THE WA-BONI HEAD-MAN . . . . . 480
WA-BONI WOMEN . . . . . 481
MY PRESENTS TO THE WA-BONI . . . . . 483
IN THE WA-BONI COUNTRY—WAITING FOR GUIDES . . . . . 485
THE DODORI RIVER . . . . . 491, 492
LOOKING DOWN THE DODORI RIVER . . . . . 495
LAST CAMP IN THE WA-BONI COUNTRY . . . . . 498
THE FORT—MOMBASA . . . . . 500
HOMEWARD BOUND . . . . . 502
RESTING AT THE WELL . . . . . 531
ARAB WELL . . . . . 586
BOWSTRING HEMP . . . . . 708
SECTIONS OF LEAVES OF SPECIES OF SANSEVIERIA . . . . . 709

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## LIST OF MAPS


| | | PAGE |
|---|---|---|
| KEY TO SECTIONAL MAPS | *facing* | ix |
| EAST AFRICA: COAST-LAND FROM MOMBASA TO MELINDI | ,, | 1 |
| SKETCH-PLAN OF MAGARINI SHAMBAS | | 39 |
| THE TANA RIVER, FROM GOLBANTI TO THE BELESONI CANAL | *facing* | 339 |
| SKETCH-MAP OF KAU AND ITS SURROUNDINGS | | 343 |
| SKETCH-MAP OF KIPINI | | 367 |
| SKETCH-MAP OF KILIMANI | | 378 |
| EAST AFRICA: MELINDI TO LAMU, INCLUDING THE LOWER SABAKI AND TANA RIVER DISTRICTS | *facing* | 378 |
| SKETCH-MAP OF FAZA | | 381 |
| SKETCH-MAP OF SIYU | | 385 |
| MAP OF PATTA ISLAND | *facing* | 388 |
| EAST AFRICA: COAST-LAND FROM LAMU TO PORT DURNFORD | ,, | 502 |
| MAP OF ZANZIBAR ISLAND | ,, | 546 |
| MAP OF PEMBA ISLAND | ,, | 604 |
| METEOROLOGICAL STATIONS IN EAST AFRICA | | 657 |


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# TRAVELS IN EAST AFRICA

## PART I.—THE MAINLAND

### INTRODUCTION

#### THE COAST-LANDS OF BRITISH EAST AFRICA

General Appearance—Vegetation—Rivers and Harbours—Rain-fall—Prevailing Winds—Temperature—Relative Humidity—Population.

THE explorations described in these pages covered (in addition to the islands of Lamu and Patta) the whole of the coast region between Mombasa and Port Durnford, extending up the Sabaki valley for upwards of one hundred miles, the country between Lamu and Port Durnford being entirely new and previously unexplored. A glance at the map shows that the country traversed by me embraces the greater part of the four hundred miles of coast-line pertaining to the British East African Protectorate.

The general appearance of this coast-line is flat and low; its leading characteristics, apart from its occasional coral nature, coral forming the principal substratum, being its frequent winding inland creeks, which are belted with dense fringes of mangroves. These creeks form natural water-ways, and are admirably adapted to serve, as in fact they do, as outlets for inland produce. Such, for instance, are the several creeks running back from the fine land-locked harbour of Mombasa or Kilifi, opening out into one of the finest havens



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on the coast, close to which is situated the large native town of Takaungu, the present outlet of the produce of the Giryama country; the network of creeks behind Lamu, Manda, and Patta Islands; and further north, the important estuary of Port Durnford.

Noticeable in another way, are the numerous small and shallow back-waters, forming what I may describe as natural salt-pans, the salt deposited by evaporation after the high neap-tides, more than supplying the needs of the surrounding population.

North of Kionga, mangroves entirely cease, and the coast continues open up to the Juba river, consisting of low rocky coral headlands, alternating with wide, shallow, white sandy bays, in which are generally found enormous masses of accumulated sea-weed; whilst south of Port Durnford an almost continuous chain of low islets forms—some distance from the coast—a natural barrier to the waves, enabling small craft to navigate the smoother water within at all seasons of the year, and the monotony of the low, white sandy ridge immediately fronting the beach is only broken here and there by scattered groups of Casuarina trees, so extensively grown in some districts of the Madras Presidency for their valuable fuel and well-known wind-resisting qualities.

Looking inland, we find a wide, very nearly flat, expanse of country, covered almost everywhere with dense low bush, and such is the general appearance of all the higher portions of the coast, in which that typical African tree, the baobab, forms a conspicuous feature. The baobab (*Adansonia digitata*) impresses an observer at once by its singular appearance, and enormous massive trunk and branches. It is a deciduous tree, and is held in great esteem amongst the natives, not only for its fruit, but also for the hard outer shell enclosing the fruit, which forms the calabash so universally used as the native water-bucket. The wood of the stem is very soft, and somewhat resembles cork, and has been found to possess qualities suitable for the manufacture of paper.

In the low-lying parts thick clumps of *Hyphæne* palms—assuming in places the proportions of regular forests—take the place of the thick bush already described. This palm—

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the dum palm (*Hyphæne thebaica*)—not only grows very extensively along special portions of the coast, but is also a prominent feature of the inland vegetation fringing the banks of the principal rivers. It yields a sap very similar to the toddy obtained from the palmyra and coco-nut palms in India, and which there forms an important article for sugar manufacture; but in East Africa unfortunately, its use so far is confined to the making of an intoxicating drink resembling the well-known arrack. It is from the flavour of the fruit that this curious palm has obtained the name of the "gingerbread tree." The fruit is of a deep brown colour and about the size

THE BAOBAB TREE.

of a small mango or orange; and from its pounded rind a flour is obtained, and eaten either raw or cooked, tasting strongly of gingerbread.

Proceeding inland, the vegetation takes the form of thick forest, which south of the Tana river becomes somewhat irregular and patchy; though as an exception to this general rule I would instance the greater portion of the Giryama country, including the fertile Sabaki valley, where the forest is of considerable size and extent, whilst north of the Tana it assumes very large proportions, so much so, that we are not able even to this day to define its actual limits and extent.

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Beyond this, the traveller emerges upon a comparatively waterless and barren country, extending to the foot of the higher interior plateau, the congenial home of cacti, euphorbia, and mimosa trees, and also exceedingly rich in varieties of aloes and fibre-yielding plants.

Such are, in brief outline, the chief physical characteristics of the coast-lands.

The river system of a country forms a most important feature of its resources, both agricultural and commercial, and in this respect British East Africa is not ill provided. Putting aside minor streams, and water-courses full only during the rains, we have first the *Umba* river in the extreme south, forming the first part of our boundary with German East Africa. Next the *Sabaki*, flowing through a rich, fertile, and almost uninhabited country, and entering the sea between the thriving coast towns of Melindi and Mombrui. Although its numerous shallow sand-banks entirely preclude navigation, the river offers other facilities—apart from decided possibilities in the matter of irrigation—such as the floating down of timber and raw fibre material, etc. About fifty miles further on, we come to the more important *Tana* river, flowing into Formosa Bay. A little above, again, is the *Ozi* river watering the very fertile district of Witu, and entering the sea to the southward of Lamu Island. These two rivers—the Tana and Ozi—are connected by the artificial canal of *Belesoni*, two miles in length, which conveys the Tana trade into the Ozi river, and thence to Lamu, for the mouth of the Tana is blocked by a sand-bar. The canal joins the Ozi at the town of Kau, about ten to twelve miles inland, whilst at the mouth of that river is another town of importance, Kipini. To the north we have first the river flowing into the Port Durnford estuary, and navigable by steamers of considerable draught, and lastly the largest river of all, the *Juba*, forming the northern boundary of our sphere.

Three of these rivers, the Tana, the Ozi, and the Juba, are navigable, though the bars at the mouths make them difficult of entrance at present. The East Africa Company's large stern-wheel steamer *Kenia*, under the charge of Commander F. G. Dundas, R.N., successfully ascended the Tana and the

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Juba and navigated the former for three hundred and fifty and the latter for four hundred miles—thus demonstrating not only the practicability of navigating these rivers with a vessel of considerable size, but their great value as future commercial highways. Besides smaller harbours, the coast possesses several capable of admitting ocean steamers, as the following particulars from the *African Pilot* will testify [1]—

"Wasin Harbour in the south, between the island of that

PORT DURNFORD ESTUARY.

name and the mainland (east of the port of Wanga), is a safe anchorage in any weather, with from six to ten fathoms.

"Its eastern entrance is clear from danger, and on the west there is a navigable channel between Tanga and Wasin inside the reefs, which has not yet been examined; but in 1878 the *Fawn* found no difficulty in proceeding from Tanga Island as far as Gomani Bay.

"Mombasa (the leading port) has several harbours. Port

[1] Part III., 1889, chap. x., and the "Revised Supplement," 1892, page 75 to end.

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Mombasa, on the eastern side of the island, is one ; it is half a mile in length and about two cables in breadth, with good anchoring depths close to the shore on either side. The anchorage is eleven to twelve fathoms water in mid-channel. *Port Tudor* is a land-locked harbour on the north side of the island, and is reached by a narrow winding channel on the east side of Mombasa Island, which has depths of from eight to twenty fathoms, and more in places with bold shores. There are few more beautiful places than this winding channel

KILINDINI HARBOUR.

with its steep wooded bank. The anchorage at Port Tudor is in from five to ten fathoms mud, and although the passage is impracticable for a sailing ship on account of its windings, there is no difficulty for a vessel, however large, to steam up to the harbour. *Port Kilindini* is a fine sheltered harbour on the west side of Mombasa Island, leading to Port Reitz, and is about two and a half miles long by half a mile wide, with depths varying from six to twenty fathoms, and as much as thirty fathoms at each end of the port, where it is narrow.

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The harbour is available for all classes of vessels. *Port Reitz* is a fine inland harbour, about four miles east and west, by one mile broad, and may be entered without difficulty through Port Kilindini, which forms the channel to it. There is anchorage in Port Reitz in twelve to fifteen fathoms mud. In February 1890 Vice-Admiral Sir E. Fremantle achored eleven men-of-war in this harbour.

"Passing the less sheltered roadsteads of Kilifi and Melindi, Lamu Bay claims the next notice, although it is partially obstructed by sand-banks and exposed to the south-west monsoon, but during the rest of the year there is good shelter in five fathoms. Lamu harbour affords secure anchorage for all vessels that can cross the bar, which carries 17 feet at low-water.

"Manda Bay, at the entrance of a large mangrove-lined creek running many miles inland, is a magnificent harbour with deep water and room for the largest ships. It is situated between Manda and Patta Islands, and is connected with Lamu harbour by a passage northward of Manda Island available for boats at half flood. The anchorage is in six fathoms water.

"Kismayu Bay, the northernmost anchorage on the east coast of Africa, is better than any other at present known northward of Manda Bay (that of Port Durnford not having yet been surveyed), and for this reason will always be valuable as a port of refuge, there being always sheltered anchorage at either end of the bay, according to the direction of the wind, in from three and a half to four fathoms water."

Records of *rain-fall* and *temperature* are now kept at several stations of the coast region under the supervision of the Royal Meteorological Society, and the results are carefully recorded in the Society's Reports. Though the coast-lands are equally subject to the influence of the same monsoons, the rain-fall is considerably less than on the neighbouring island of Zanzibar, and this difference may be put down at from 15 to 20 inches. The rains follow the sun, commencing soon after the latter has passed the zenith, and the two rainy seasons, inaugurated by the S.W. and N.E. monsoons, are distinguished locally as—

The Greater Rains = "Masika M'Ku."
The Lesser Rains = "Masika M'Dogo" or "M'Luli."

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The Greater Rains commence in March, with the heaviest fall in April and May, and continue with gradually diminishing force to September.

The Lesser Rains begin in October, and practically end in November, for though the wind continues steadily from the N.N.E., the rain-fall in December, January, and February is uncertain. It is during these latter months that the greatest heat prevails, particularly in January and February.

Mr. Ravenstein, taking the records of rain-fall for about ten years, estimates the average for Mombasa to be 51 inches. This is more than confirmed by the following record of rain-fall for five years kept at Frere Town, on the mainland opposite Mombasa.

[1] RECORDS OF RAIN-FALL DURING THE YEARS 1876 TO 1880, MEASURED AT FRERE TOWN NEAR MOMBASA.

| *Months* | 1876 | 1877 | 1878 | 1879 | 1880 | *Average of five years* |
|---|---|---|---|---|---|---|
| January... ... | ·35 | ·25 | 7·66 | ·57 | — | 1·77 |
| February ... | ·18 | — | ·51 | 3·17 | ·36 | ·84 |
| March ... ... | 3·57 | 3·71 | 4·75 | 1·39 | 1·96 | 3·08 |
| April ... ... | 6·00 | 4·50 | 12·46 | 10·50 | 6·31 | 7·95 |
| May ... ... | 16·16 | 12·82 | 4·46 | 16·36 | 9·62 | 11·88 |
| June ... ... | 3·11 | 6·71 | 8·08 | 4·31 | 1·10 | 4·66 |
| July ... ... | 4·60 | 4·10 | 1·90 | 2·02 | 9·45 | 4·41 |
| August ... ... | 2·68 | 9·79 | 4·26 | 1·81 | 1·39 | 3·99 |
| September ... | 2·66 | 10·75 | 3·09 | 1·25 | 2·15 | 3·98 |
| October... ... | ·97 | 12·44 | 3·04 | ·44 | 4·39 | 4·26 |
| November ... | ·56 | 21·05 | 2·09 | 3·20 | 6·26 | 6·63 |
| December ... | ·60 | 3·49 | ·30 | ·55 | 1·76 | 1·34 |
| | 41·44 | 89·61 | 52·60 | 45·57 | 44·75 | 54·79 |

That the excessive fall of 89·61 inches in 1877 is no exaggeration is proved by the fact that the Rev. Thomas Wakefield measured 90 inches at the neighbouring Mission

[1] For further information concerning *rain-fall* and *temperature*, see Appendix C.

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Station of Ribé in the same year. The quantity which has fallen on particular days has occasionally been excessive, as for instance a fall 5·50 inches was registered at Magarini on May 14, 1892, 13·81 inches falling during that month. On the other hand, the rain-fall is often uncertain and variable, as evidenced by the record of only 26 inches in Mombasa in 1892, the difference of the fall in the same month being even more marked.

Mr. Ravenstein, accepting 51 inches as the mean for Mombasa, is led to believe that the following will represent the mean annual rain-fall along the coast—

| | |
|---|---|
| Mombasa ... ... ... ... ... | 51 inches |
| Melindi and Jelori ... ... ... | 45 „ |
| Magarini ... ... ... ... ... | 39 „ |
| Lamu ... ... ... ... ... | 37 „ |
| Kismayu ... ... ... ... ... | 11 „ |

the rain-fall, as will be seen, decreasing rapidly as one proceeds northward along the coast.

My own experience of the wet season in the Witu district inclines me to think that though perhaps occurring earlier, the rain-fall may prove as heavy as further south. This is an important question which only future records can decide.

"Observations of the *wind* were made at Chuyu, Melindi, and Witu. Local circumstances undoubtedly influence the direction of the wind, as does also the hour of the day, but, broadly speaking, it may be stated that southerly or south-westerly winds prevail from March or April to September or October, whilst easterly or north-easterly winds are supreme during the remainder of the year."[1]

From the same authority I quote the following remarks on the temperature and relative humidity along the coast zone.

Mr. Ravenstein premises that the observations "are as yet far too scanty and imperfect to enable us to deduce from

[1] Report on Meteorological Observations in British East Africa for 1893, by E. G. Ravenstein, F. R. Met. Soc. (Geo. Philip & Son).

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them true means of the temperature, and still less of the rain-fall and humidity." Of the temperature he states that "the mean annual temperature varies from 78° (Chuyu, Magarini) to 82° (Mombasa). The coolest month (June, July, or August) has a mean temperature of from 74° to 76°, the hottest (February or March) of from 81·5° to 86° (at Kismayu). The lowest temperature recorded during 1893 was 63° (Lamu, in June), the highest 94° (Magarini, in December). The annual range, that is the difference between the means of the coolest and hottest months, amounts, at Mombasa, to only 5·8° F., which is the same as at Zanzibar, whilst at Kismayu it probably exceeds 10° F. This range, it need hardly be stated, is exceedingly small as compared with what is experienced in Europe. The daily range, which at Zanzibar amounts to 7·8°, reaches 7·7° F. at Mombasa and 13° at Magarini. The extreme months at Zanzibar are April (7° F.) and September (8·9° F.). At Mombasa they are November (5·3° F.) and August (9·6° F.); at Magarini, June (9·0°) and December (16·2°), the greater range at Magarini being due, no doubt, to its inland situation on the slope of a hill. Hygienically this small daily range may be looked upon as a favourable feature of the climate of Eastern Africa.

"The *relative humidity* at Mombasa, Melindi, and Witu amounts to 81 per cent. At Lamu it is probably higher. The atmosphere is driest immediately before or shortly after the commencement of the heavy rains, say in March, dampest in the month having the heaviest rain-fall, namely, April or May."

For the purpose of comparison with the foregoing figures, I may add that at Greenwich—

| | |
|---|---|
| The mean temperature is, for year ... | 49·5° F. |
| „ Annual range ... ... ... ... | 23·9° |
| „ Mean daily range ... ... ... | 10·6° |
| „ Relative humidity ... ... ... | 82% |
| „ Annual rain-fall ... ... ... | 25 inches. |

As regards the *population* of the coast region, the towns are chiefly inhabited by Swahilis, Indians (Parsees, Banians),

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and Arabs—although under the latter name the Swahili is generally classed, the admixture of Arab blood being so strong. The immediate coast-lands—that is, for ten miles inland—are peopled mainly by Swahilis, with some intermixture of the aboriginal tribes beyond. Of these I shall speak more fully later on.

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# CHAPTER I

## ARRIVAL IN AFRICA—JOURNEY TO THE MAGARINI SHAMBAS

Landing at Mombasa--Scope of my Mission—Departure for Melindi—Interviews with the Liwalis of Melindi and Mombrui—Ground Cultivation, Coco-nuts—Start for Shambas—Sabaki River—Mombrui—First Night in a Slave Village—Native System of Agriculture—Labour Question—Cotton—The Wanika—Scarcity of Water Supply—The African Slave.

ON July 9, 1891, I arrived at Mombasa to take charge of certain plantations lately acquired by the Imperial British East Africa Company in the Melindi district further up the coast, my instructions being to work and develop these as fully as possible, and to assume concurrently, the agricultural supervision of the whole of the Melindi and Sabaki districts with the view of improving the native cultivation generally. The scope of my mission was subsequently extended, so as to embrace not only an examination of the spice and other products of Zanzibar and Pemba, but also a detailed inspection of the country between Mombasa and Melindi, the Sabaki region inland, and along the coast from Melindi to Lamu and northward to Port Durnford. My sphere of operations also included the districts behind this coast-line which comprise the basin of the lower Tana, the Protectorate of Witu, and the countries of the Wa-Galla, Somalis, Wa-Boni and other tribes, as well as the islands of Lamu and Patta off the Witu coast.

I remained in Mombasa five days while making the numerous necessary preparations for my journey to the shambas, during which interval I was the guest of Mr. J. R.



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W. Pigott, the Company's Acting Administrator. In the complicated business of procuring supplies, implements, servants, etc., I was cordially assisted by the various officials at headquarters. Amongst the supplies I took with me were several bags of tobacco and cotton-seed for the purpose of improving the cultivation of these products. On July 15 I sailed from Mombasa in the Company's coasting steamer *Henry Wright*, accompanied by Mr. Weaver (who afterwards became

LANDING-PLACE, MOMBASA.

my assistant). After a fairly good passage we reached Melindi at 5 p.m. the same day. I was met on board by Mr. Bell-Smith, the officer in charge of the Melindi district (who was afterwards, I regret to say, shot by a native). His house, a two-storied white building on the beach, was a conspicuous object from the sea, and here we took up our quarters during our stay in Melindi. I was much pleased with the appearance of the town, which was larger than I

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expected. I could see the hill of the Magarini shambas in the distance—about eighteen miles' journey, though not more than ten miles as the crow flies. In the evening Ali bin Salim, Liwali of Mombrui, son of the Liwali of Mombasa, came to pay me a visit, and we had a pleasant chat together. After morning tea on the 16th, I went on board the *Henry Wright* to superintend the landing of my baggage. The Arab captain not understanding English, I had to go down into the hold several times to secure my belongings, and very hot work I

DISTRICT OFFICER'S HOUSE, MELINDI.

found it! In the afternoon Said bin Hamid, the Liwali of Melindi, a fine handsome Swahili, came to call. He and the Liwali of Mombrui were trustees of the Melindi shambas, which were the confiscated property of a deposed rebel (Suliman bin Abdulla), and being heavily mortgaged, the estate was administered by the Company at the request of the Sultan of Zanzibar.

Next day (July 17) the Arab and Swahili New Year, I called on the Liwali, Said bin Hamid, who gave us sweetmeats and coffee in tiny cups, and showed us the handsome

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sword presented to him by the Directors of the Company for his services on their taking over the country from the Sultan of Zanzibar. Later on we called on the Liwali of Mombrui, who similarly entertained us. In the afternoon I went to see the Liwali of Melindi's garden, and was much pleased with the appearance of the fine coco-nut trees, which were planted about 24 feet apart. The soil was black and free, and struck me as suitable for cotton. A crop of maize had been just reaped, and the land was then under sim-sim

SAID BIN HAMID, LIWALI OF MELINDI.

(Sesame or Gingelly). The rich soil appeared to bear readily the rapid succession of crops, beginning with Guinea corn or *metamah*, maize coming next and being followed by sim-sim, often put down before the last crop was out of the ground.

The Liwali, who professed great willingness to assist me by every means in his power, brought two samples of tobacco for my inspection. The first was the local variety grown near the Sabaki river, with very coarse dark leaves; this tobacco is very strong, and is only used for snuffing and chewing. The

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other was imported Arabian, and the light yellow leaves had still the whole stalk adhering to them, the whole plant having apparently been cut down and cured at the same time.

On the morning of July 19 I walked to see the Pillar erected by Vasco da Gama to commemorate his visit to Melindi in the year 1498, when his ship was nearly wrecked. This Pillar, still in perfect preservation, is situated on a small

VASCO DA GAMA'S PILLAR, MELINDI.

point south of Melindi, and forms a leading mark for ships coming in.

I returned inland through some coco-nut plantations, the largest I passed through belonging to the Liwali of Mombasa. The trees—planted wide apart, generally 40 × 40 feet, to allow of ground-produce being grown below—appeared but little cared for, the ground beneath being overgrown with grass and weeds, and only here and there had the ground been hoed a few feet from the trees, and the weeds and

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rubbish banked up round the stems. I remarked also near some slave-huts a large heap of husks thrown aside as useless, a proof that no use was made of the fibre. On July 20 I sent off my loads, packed on seven camels (a camel carries from 360 to 370 pounds), one relay going to the Sabaki river, about four miles away, while the Liwali of Mombrui, Ali bin Salim, very kindly took personal charge of them as far as Mombrui. In the afternoon I went for a walk along the sea-shore, and was struck with the very large quantity of sea-weed that was washed up, its excellent manuring qualities not being understood by the natives.

Bell-Smith and I left next day for Suliman's shambas at about 9 a.m., starting on donkeys, lent to us by the Liwali of Melindi, who accompanied us. The donkeys were good ones and apparently much valued, costing from fifty dollars and upwards (one dollar equals $2\frac{1}{8}$ rupees). They are generally fed on metamah. My saddle consisted of some cloths lent by the Liwali, with a coir rope for stirrups, and my donkey's name was "Go easy." Three camels with the remaining loads started after us in charge of Bell-Smith's head-man. We rode along the sea-shore over a magnificent sandy beach, which would have delighted the hearts of English children, till we reached the Sabaki river, distant four miles from Melindi. This river, deep and very yellow in colour, flows into the sea through muddy mangrove flats.

We crossed over in a small native canoe, the only means of transport for goods and men. Camels and donkeys cannot ford the river on account of the numerous crocodiles, of which we shot one basking on the bank. A cow had been attacked and killed by one only a few days before. On the other side we found fresh donkeys waiting for us, mine, this time, rejoicing in the name of "Old woman"! We continued along the shore, still the same fine sandy beach with a fine view of the breakers rolling in. About noon we reached the picturesque little town of Mombrui situated on the sea-shore, and rode straight to the Liwali's house, where we were shown into a fine room, decorated with French mirrors, and where we presently received visits from the elders of the town, sweetmeats, coffee, and a hookah being passed round. After



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this, breakfast was served for us in a room containing a European bed with gorgeous mattresses and pillows, a musical box and a large French mirror! Our *plâts* consisted of curried and roast fowl, rice and green coco-nuts; this fruit when green contains merely a cold sweet water which is a most refreshing beverage on a hot day.

At 2.30 p.m. we bade farewell to our host, and, still accompanied by the Liwali of Melindi, proceeded on our journey to Magarini over a fertile undulating plain, with slave villages, and coco-nut shambas surrounded by high thorn fences scattered here and there; and this being my first glimpse of native cultivation I was much interested. The soil was chiefly a rich black friable loam, interspersed in places with red loam, and very fertile; in some of the metamah fields we passed through, the stalks were nearly 12 feet high. The bean and sim-sim fields were also most luxuriant, and the vegetation of the abandoned patches covered with thick bush and grass also bore witness to the richness of the soil.

Nearly the whole way from Mombrui to the shambas, we passed through cultivated land. The Liwali pointed out some patches of Guinea corn, the leaves of which were suffering from a disease somewhat resembling rust.

I noticed that "goat weed" and "ilook grass" were the prevalent weeds; the latter (*Imperata Koenigii*), of which there are two varieties, one broad-bladed and the other thin and spiral, is most difficult to eradicate when once it gets a hold upon the land, and the system of cultivation carried on by the Swahilis does not tend to discourage its spread. Guinea corn appeared to be most grown, though I also saw patches of poor-looking rice growing in hollows.

Arriving at last at Suliman's shambas I discovered that this property consisted, not of one block of land as I had expected, but of many distinct and scattered plantations. The first we entered, though much neglected and grass-grown, consisted of fine coco-nuts interspersed with mango trees and banana clumps, and looked promising—in the centre was situated one of the three slave villages that existed on

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MOMBRUI.

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the property.[1] This plantation, as well as others adjacent to it, was entered through a massive wooden gateway, and protected by a thick impenetrable thorn fence surrounding it on all sides.

Leaving the plantations and passing some scattered houses and cultivated plots, we came to a large valley where Suliman had formerly grown sugar-cane. A good deal of it was still growing wild, and in its centre stood the abandoned sugar-mill with its disused and rusty machinery. We then passed the second slave village on our right. Just ahead of us, rising out of the sugar-cane valley, was a low hill called Magarini,

NATIVE VILLAGE—SHAMBA M'PANDIANI.

and on its top was situated the third and largest slave village, a ruined mosque, patches of cultivated land, and Suliman's house, these being surrounded by a strong wooden stockade, and the entrance defended by an old cannon. Suliman's house was our head-quarters, and there we arrived at 6 p.m. We found that the three camels carrying our gear had not yet turned up—what had arrived had suffered severely in its passage over the Sabaki—all the lanterns and my filter were broken, the sugar had all melted, and only one whole tumbler was left! However, we all thoroughly enjoyed our make-

[1] All the slaves were freed by order of the Directors of the Company, and employed on wages as free people.

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shift meal of bacon and eggs, and sweet biscuits, supplemented with the Liwali's rice and a corn-flour pudding.

Said bin Hamid gave us his own tent, and he slept in the verandah. It was my first night in a tent, and a truly miserable one it was; the mosquitoes simply swarmed and made sleep perfectly impossible.

I spent most of the following day in unpacking my gear, and as I was likely to spend much time there, Suliman's house had been given to me for my head-quarters. However, upon examination I found it in such a state of dilapidation that the cost of repairing it in a suitable manner for a European would be too great, so I decided to live in the Liwali's tent until my own arrived. I converted one of the rooms into a store-room and secured it with a padlock. I was not likely, after my experiences of the preceding night, to forget mosquito-curtains. Bell-Smith sent down to Melindi for some, and they arrived by nightfall.

The better acquainted I became with the various native ways and customs, the greater and more difficult my task seemed to be. No ploughing whatever appeared to be done —if indeed any knowledge of it existed—whilst land cultivation of every description, from the preliminary clearing and hoeing to the final harvesting operations was carried on entirely by slave labour—the only one available. It followed that the value, and indeed *the extent, of cultivated land depended entirely upon the number of available slaves*—a landowner's wealth and position being judged accordingly.

Ever since the issue of the Sultan of Zanzibar's Anti-Slavery Decree in 1890, land had been steadily going out of cultivation, a result due, first, to the discouragement caused amongst the Arabs and Swahilis, who are the principal cultivators on the coast, and secondly, to the growing scarcity of slaves; for, by the gradual extension of our influence and stations in the interior, the East Africa Company was shutting off their usual sources of supply.

The actual system of cultivation carried on was primitive to a degree. A native apparently cleared at random any plot of land of its jungle, weeds and bush, which he burned, leaving the roots in the soil; he then hoed up the land, and

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after raising a few crops of Guinea corn, sim-sim or maize, abandoned it when the soil was exhausted, and went off to clear another plot in the same manner. The abandoned plots soon reverting back to bush, land being plentiful enough everywhere for carrying on this wasteful system, the appearance of the country, even in the most fertile portions, is marred by numerous patches of once cultivated land.

Cultivation at the time of my arrival was in a state of deterioration, being worked on a harmful and primitive system with a steadily decreasing slave supply.

To remedy this state of things, it seemed to me that the most urgent reform required was the development of a better labour supply and the improvement of agricultural methods.

As to the Labour question I could not help thinking that as a commencement, the introduction of thirty or forty ryots selected from the cotton and tobacco producing districts of Southern India, would exercise a stimulating and educating effect upon a race, not without knowledge and capacity, but requiring to be taught, and totally wanting in the industrious and thrifty habits that distinguish the Hindoo peasant.

The question of cattle for draught and ploughing purposes was another important matter. The Arabs, through dread of the cattle disease that swept down the coast periodically from Somaliland, were deterred from possessing many animals, and, as I pointed out in my first Report dealing with these matters, a small beginning might at once be made, as an example, by training a few bullocks and native donkeys to plough with the small light ploughs that are used in India, and could be imported for the purpose.

I have been led to enlarge upon this subject because of a visit I received the day after my arrival, from the chief of a village of the Wanika, a numerous tribe which inhabits the coast district. The Liwali spoke to him for me, and the chief expressed his willingness, and indeed the eagerness of his people, to hire themselves out to work. I promised to pay them daily, and I thought the prospect of utilizing such a labour supply most encouraging. I understood that a large number of their villages existed round about, and if they could be induced to work regularly the great difficulty of

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labour supply would be overcome. Of course such people could only be unskilled labourers, but even so, it would be a great point gained to secure a number of them, and the knowledge that money was to be earned on the plantations could not fail to attract others. Later on the results of this experiment will be shown.

In the afternoon I took my first walk through the shamba, and inspected the cotton, the seed of which had been given to Suliman by Bell-Smith two years before. It was very scattered, and that any plants survived at all after the neglect it had suffered, spoke volumes for its hardiness and suitability to the country—it had been planted amongst pomegranate trees. As a beginning, I proposed clearing this cotton area with Wanika labourers. Further on there were a few date-palms which had been planted by Suliman. Apparently the whole of Magarini Hill had been cleared by him at one time, but now there were only a few patches of metamah growing here and there, and even that was not in very good condition. The soil on which the cotton grew was red loam with strong indications of iron, shown by the black markings wherever the upper surface had been washed away; elsewhere it was of a rich black sandy loam, and rank vegetation covered the portions that had lapsed from cultivation.

The following day (July 23) I went to visit two Wanika villages. I was much pleased with these people; they seemed good-humoured and willing. The nearer village was small, the other much larger. The head-man or chief of the smaller village said he could bring me many people, men, women and children, to work—so I went away, looking forward with pleasure to the working out of this experiment. Close by, we obtained a fine view of the country towards the west, and beyond that, as far as the eye could see, there was nothing but virgin bush—the whole of the land presenting the same undulating character. The Wanika said there was no river nearer than the Sabaki. This part of the country was apparently quite unexplored, as they told us that we were the first Europeans who had entered their villages. A large crowd surrounded us; the women were fairly good-

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A WANIKA HEAD-MAN.

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looking, and wore a curious petticoat very similar to a Scotch kilt. One girl had her hair all strung with beads, which looked very curious and pretty. We waited a while to see the head-man, but he was away. However, we saw him in the afternoon, and the Liwali acting as interpreter, I agreed with the chief on the following terms for labourers—For the men, twelve pice a day; for women, ten pice; and for children, six pice a day; the working hours to be from 7 till 11 a.m. and from 1 till 5 p.m. The head-man guaranteed to supply me with fifty people from his village at any

WANIKA VILLAGE.

time, the pay to be given daily on completion of the day's work. I felt that this arrangement was an important step.

Later on, Bell-Smith and I went to inspect the water supply. The scarcity of water in Africa strikes a stranger very forcibly. At Magarini the water had to be carried a distance of half a mile, and this was considered quite near. There were three wells in the sugar-cane valley below Magarini Hill. In the nearest the water was discoloured and not good, but five to eight minutes' walk further on were two others yielding good fresh water. I heard they gave out in very dry seasons.

On the slope of Magarini Hill there are two springs; the

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water is quite brackish and undrinkable. This curious freak—whether by percolation or otherwise—had injuriously affected the sugar-cane in the valley below, the sap becoming quite salty.

Bell-Smith proved exceedingly kind, and his local knowledge was most useful to me in my first days in the country. He was of particular assistance in endeavouring to find me a good head-man whom I could leave in charge of the plantations during my absences on other duties, and recommended his labour contractor (for loading Arab dhows during the grain shipping season), sending to Melindi for him.

A brief description of the East African slaves and their customs will form a suitable close to the present chapter, and may prove of interest, for my duties have led me to live and mix amongst them perhaps more intimately than falls to the lot of the average European.

Brought down to the coast, the captive is sold to the highest bidder, the average price for a full-grown adult being $40; roughly, about £7 of our money. He now becomes as absolutely the property of his master as his dog or other domestic animal, for the remainder of his life, and this holds not only for himself, but for any possible children he may have.

Should he wish to marry a fellow-slave, he has to pay his master a fee of $2. Should it be asked how he is to obtain this, let me remark that the life of a slave, however intolerable such must naturally appear in our eyes, is not really the utterly miserable and wretched one that most English people imagine it to be.

First as to his work. For all the principal cultivating operations, such as harvesting and threshing the corn, he has to turn out and work from eight in the morning till five at night; but for the sowing of the grain he is required to be out by early dawn. For all other minor operations, such as clearing new land, weeding, etc., a daily task fixed by custom is allotted to each as follows—

Clearing new land, one hundred yards by four yards; hoeing cleared land, two hundred yards by four yards.

The slaves are generally worked in gangs, varying from

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WANIKA WOMEN.

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five to twenty, each gang being in charge of a head-man, called "nakoa," also a slave, who measures out the various allotments, and is responsible for the work done by his particular gang.

Women are told off, and given small produce, such as fruit, cassava, etc., to the value of a quarter-dollar, which they sell in the market-places and elsewhere, accounting for the value of the proceeds to their owner.

The privileges of a slave are these—On all "shambas," as native plantations are called, each slave is entitled—

EAST AFRICAN SLAVES.

During the dry season to two free days during each week—every Thursday and Friday.

In the wet season, which usually commences by the middle or end of March, he receives only one holiday in the week—on Friday (the Mohamedan Sunday); besides this, each slave actually working on the plantation receives during the whole of the cultivating season one "kibaba" (about one pint) of meal daily.

Women and children watching the grain against birds (the work being lighter) receive no free days.

When drawing toddy from coco-nut trees, the slaves employed get no holiday either; but all toddy drawn by them on Friday is their own, to dispose of as they wish.

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Each slave is allowed an allotment for his own cultivation, and the size of this varies from two hundred by ten yards, to two hundred by fifty yards, the produce from which belongs to him entirely.

No owner has any right to enter a slave's house, unless in a very extreme case, such as searching for a runaway, etc. The master also never interferes with, nor has any claim on, any poultry or other domestic animals reared and owned by his slaves.

And, lastly, concerning the actual treatment of the slaves. It is entirely against an owner's interest to ill-treat or overwork them, for if ill-used or harshly dealt with in any way, they invariably escape to the various runaway-slave settlements up the Sabaki and elsewhere in the bush.

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## CHAPTER II

### LIFE AT MAGARINI

Friendliness of the Liwalis—Nasur bin Suliman's Shambas—Charming Country—Commissariat Troubles—Choice of Head-quarters—Silence of the African Night—Shambas under my Supervision—Luxuriant Vegetation—Proposed Improvements—My Native Staff—Engagement of Head-man—M'Doro the Nika Head-man—Native Path to Melindi—The Jorori River—A Ducking—Dum Palms—Native Clearings—Suitability of the Soil for Cotton—Ferry over the Sabaki—A Primitive Bridge—Return to the Shambas.

I TAKE this opportunity to again acknowledge with thanks all the assistance and friendliness that I received from the Liwali of Melindi. He entered into my proposed schemes with great zeal and heartiness, and I found him an unusually intelligent and liberal-minded gentleman. He sat talking and smoking with us and joined us at our meals, we exchanged dishes, and indeed he often kept our table going when our own supplies ran short, for I was not proficient in African housekeeping at first.

The Liwali of Mombrui also came to the rescue, and kindly supplied us with milk until I got some goats.

In the afternoon of July 24 the labour-contractor from Melindi arrived. He seemed a suitable man and I offered to engage him, but he said he would have to consult his family, and returned to do so. I afterwards heard, that for family reasons he could not accept my offer—this was a disappointment. The Liwali then suggested a man who was in charge of one of his own shambas, the son of an influential man in Melindi, and I finally engaged him. The next day the Liwali and I started off to inspect Nasur bin Suliman's shambas, also administered by the Company, and as they were about



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five miles off, we arranged to breakfast there. On the way we passed many baobab trees, the large trunks and stunted branches of which are typical objects in the African landscape. We also passed some good patches of metamah and a good deal of abandoned land. Land once cleared becomes the property of the man who clears it, remaining his even when abandoned, and such land can now be bought very cheaply owing to the scarcity of slaves.

I noticed that "bomas" (as the stockades or thorn fences are called) were erected only round slave villages and permanently cultivated areas, such as plantations of coco-nuts, mangoes, etc. All other cultivation was carried on entirely in the open, the different fields being separated only by patches of once cleared land. About two and a half miles from Magarini we came to an important shamba of Suliman's, called Shamba Baraka, from the name of the original owner (Baraka); it was the largest that I had seen, and was surrounded on all sides by a high boma fence. It contained a large number of flourishing young coco-nut trees, numerous bananas and plantains, patches of rice, sugar-cane, and Guinea corn, with a number of fine lime and orange trees, but was overrun with grass and weeds, as indeed was the whole property. I was given to understand that since the deportation of Suliman, the labourers on this property had become a by-word for laziness and rascality, which under the circumstances was perhaps not surprising. Sixty of them were absent serving as caravan-porters—a favourite employment with the natives, as they receive higher wages as well as rations, and they like the roving life. I foresaw much up-hill work in re-organizing a demoralized labour force of this character.

Leaving Shamba Baraka we passed through some charming country, stretches of Guinea corn extending as far as could be seen in every direction, varied with well-weeded fields of rice and sim-sim. The Liwali told me that only the best land would be retained, the remainder being allowed to revert to bush. We now passed through the native town or village of *Boma-Upandi*, very clean-looking, and surrounded by coco-nut plantations and mango trees.

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After two hours' walking we arrived at Nasur bin Suliman's plantation. It had a good boma round it, but owing to the scarcity of labour it was very little cultivated; in about the centre there were some slave huts and a large house, partly a mosque, the habitation of the former owner, but which was fast falling into decay. The outside cultivation, exclusive of the slaves' own plots, consisted of two patches of metamah and one of sim-sim; the surrounding country was gently undulating and the ground seemed suitable for the plough, the absence of stones in the soil being a striking characteristic. Another of Suliman's shambas was situated close to the village of Boma-Upandi, and named after it. It contained about six hundred coco-nut trees, large and small, and some cassava and rice.

On July 26 the new head-man, Ali bin Jumah bin Abdulla, arrived from Melindi, and I engaged him at twenty-five rupees a month. After dinner the Liwali came to sit with us as usual, and we had a long conversation respecting the shambas, and the grave necessity for re-organizing the labour supply. The next morning our provisions ran short for breakfast, and I could only muster bad tea and chupatties. Latterly we had been living in an uncertain way as regards food—some days there were no fowls to be had, other days we had plenty. An old biscuit-box contained our sugar; our pepper-castor was a small bottle with a piece of perforated paper tied over it; our plates, cups, saucers, and saucepans were of enamelled iron, but one day our food was full of bits of enamel, which were not pleasant eating! The saucepan-lining had come to grief in some way. Our water supply was scanty and its colour hardly inviting—it always left a yellow sediment of earth at the bottom of the glass—and a bath every third day was a positive luxury.

As I began to understand the lie of the various shambas, I decided to make Magarini Hill my head-quarters as being most central.

At about 9 a.m., on the 27th, the Liwali, Bell-Smith, and I left for the lower shambas, visiting several on our way to Shamba M'Pandiani, the largest of all, and the one I had visited on my way up. Besides the slave village, it contained

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a half-built house, kitchen and bath-house erected by Suliman, who had made this place his low country residence, and here we pitched our tents. The Liwali left in the afternoon to return to Melindi, and I was quite sorry to part with him, being quite charmed with his manners and ways—he being the first Arab gentleman I had as yet intimately associated with.

The difference of temperature as compared with Magarini was very marked; we had no cold wind in the morning, and there were very few mosquitoes at night.

That afternoon and the following day we went over the remainder of the shambas, a detailed list of which I give further on. We spent a very quiet evening in camp, the last I was to have with Bell-Smith, who was returning to Melindi next day. I parted from him with regret, for he had been most obliging. He left early the next morning, and I was now quite alone in East Africa for the first time.

I returned to Magarini to my solitary breakfast. In the afternoon the Liwali of Mombrui arrived and quite concurred in my proposed plans, and after going through and handing over to me the accounts of the property, which being kept in the Arabic manner were complicated and puzzling to a degree, he returned to Mombrui. I then called all the head-men together, and addressed them through my interpreter Ramazan. I impressed upon them the fact that I had come up as the Company's representative, to do away with all the old bad practices and ways, that a new and brighter time had begun for them all, and that I looked and trusted to them to help and assist me as much as they could.

It however took the people some time to get over their surprise at a white man actually coming to live amongst them. On their return from work in the evening, a curious crowd stood a little distance away watching my every action with the keenest interest and wonder. To see me eating, writing, or reading—doing all this in their own village—was at first even a greater source of interest than the preparation of their own evening meal. In the mornings too, however early I got up, I was sure to find, on coming out of my tent, a number of Wanika already squatting outside patiently waiting to get a sight of the white man and to watch his curious ways.

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FREED SLAVES—MAGARINI PLANTATIONS.

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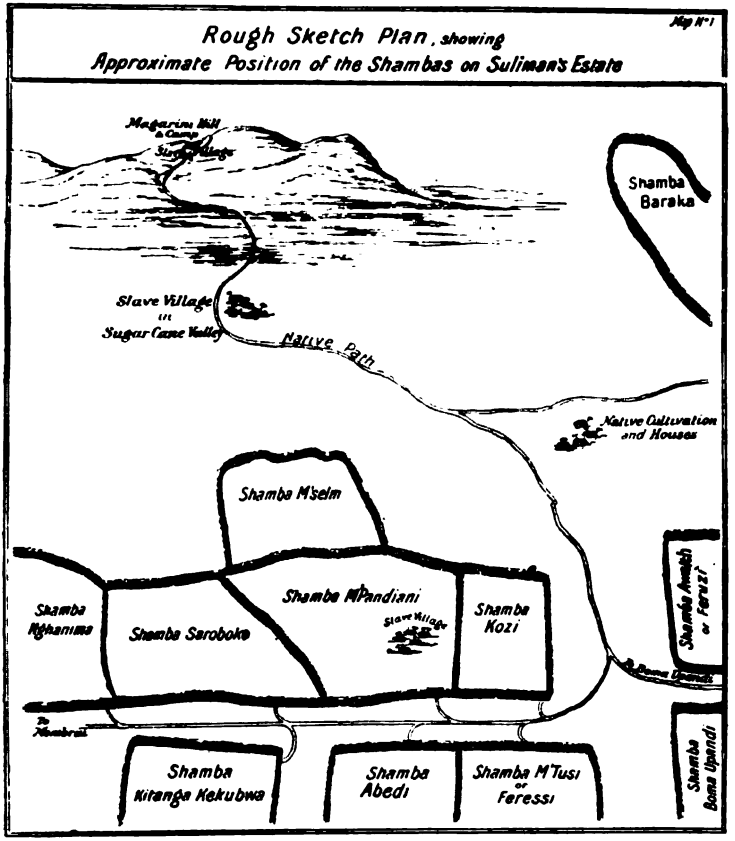
My first evening felt very lonely, but I was interested in my work, and that helped to counteract my sense of solitude. The air was wonderfully cool and still, and I was much struck by the silence of the African night.

I here give the list of shambas on Suliman's estate; the




annexed map will make their position easier to understand. Of enclosed plantations, and not including Magarini, there were eleven—

1. *Shamba Baraka*, very large, and containing numbers of young coco-nuts mostly four years old, bananas, and patches of sugar-cane, rice, and cassava, with many fruit trees.

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2. *Shamba Awalthi*, or *Feruzi*, noted for the large yield of its coco-nut trees. Besides the usual sugar-cane and cassava, there were also a few betel-nut palms, and about fifty silk-cotton trees.

3. *Shamba Upandi* (about four miles from Magarini), called after the village of that name.

4. *Shamba Kozi*, planted with young coco-nuts, bananas, and rice.

5. *Shamba M'Tusi*, open, and chiefly under grain, with some banana clumps.

6. *Shamba Abedi*, another coco-nut shamba.

7. *Shamba M'Pandiani*, the largest of the group, and containing some very fine coco-nuts and a few betel-nut palms.

8. *Shamba M'Selm*, chiefly planted with mango trees.

9. *Shamba Kitanga Kekubwa*, another mango plantation with clumps of pineapples and many fruit trees.

10. *Shamba Saraboko*, containing a small swamp, the chief products being many mango trees, some coco-nuts and betel-nut palms, and numerous banana clumps.

11. *Shamba Nghanima*, all coco-nuts.

Besides these the estate comprised a good deal of open land, on five portions of which clearings for Guinea corn had been made. The whole of these were now under my supervision, and contained altogether nearly nineteen thousand coco-nut trees.

I had not realized until now that the property was so large or so valuable, or that the soil could produce what it did. Everything attempted by Suliman had done well, and the result showed the great productiveness and fertility of the country, and what could be accomplished by one enterprising man. All the different products, such as coco-nuts, betel-nut palms, mangoes, etc., compared most favourably with those of India and Ceylon, notably in the yield of coco-nuts. (The Liwali of Melindi estimated the yield for this year from all the shambas at from 10,000 to 12,000 nuts.) Custard-apples, oranges, limes, sweet limes, shaddock, pomegranates, fig trees, jack trees, bananas, cotton plants, capsicums, all throve here most luxuriantly—and of the fine appearance of the Guinea corn and sesame I have already spoken.

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There were, however, many things that called for immediate attention, such as the appointment of watchmen to the respective shambas—robberies of fruit and produce being carried on wholesale; weeding the different shambas, which were in a terribly neglected condition; gathering coco-nuts, mango and plantains, etc. There was also the matter of transport to the coast by camels and donkeys to be organized. Altogether a good deal of work.

Here let me mention some of the ideas that occurred to me from what I had seen up to the present, as to the cultivation to be carried on.

First, I decidedly thought that for the purposes of these plantations, two of the lightest ryot ploughs should be obtained from India. Secondly, in the absence of cattle, donkeys could be trained for draught work. It had been further suggested by the Directors that a few of the Indian police, which the Company kept stationed at Witu, might be utilized for ploughing and for training future stock, and this plan was in my own opinion also the best and cheapest, as otherwise the hoeing of the land I proposed clearing would involve heavy expense.

Thirdly, I proposed experimenting with the cultivation of the various varieties of American and Indian cotton, for which I thought the country well adapted; tobacco, and such other products as I found by experience suitable to the climate. The pepper-vine I hoped would do well, the shaded and wind-sheltered area afforded by the various mango plantations offering a splendid field for future experiments.

It was further proposed that I should visit the islands of Zanzibar and Pemba to obtain information on their spice cultivation, and what products could be introduced on the mainland.

This is the list of my newly-organized native staff. They were—

1. *Ali bin Jumah*, the head overseer.
2. *Nakoa Feruzi*, at seven rupees a month at Magarini shambas.
3. *Nakoa Mabruke*, at Shamba M'Pandiani.
4. *Nakoa Ambari*, to accompany the head overseer, and

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convey his orders and instructions. These two at five rupees monthly.

5. Lastly, *Saif bin Salim*, the old head-man whom I retained for the present.

The morning after Bell-Smith's departure I received a letter from him, his messengers also bringing me ten English rifles with pouches and belts and two hundred rounds of ammunition. He also sent me a boy called Uledi, a former slave of Suliman's, who knew the shambas well, and I engaged him for my personal service.

The same morning Ali bin Jumah arrived, and I had a long conversation with him, assigning him a residence in Suliman's house. I instructed him first to go round all the shambas one by one, estimating the crop of each product they contained; to measure the length and breadth of each, so as to have an accurate record of their area; to report on the number of watchmen required, with a view to appointing them forthwith, giving each man a gun, and holding him strictly responsible for his special guard.

That afternoon I had some practice in simple surgery, which every European in such circumstances is expected to know. A native was bitten by a snake in the foot; he said it was a black snake, but it could not have been a very poisonous one, for though the man had been bitten some hours before he came to me, the foot was not swollen. I lanced the wound and applied a poultice of hot metamah to it. I also dressed the hand of Saif bin Salim, which had been cut some days before.

The next day (Friday) was the Mohamedan Sunday, which I spent in writing reports. Ali bin Jumah, having nothing else to do, made himself a great nuisance by coming to my tent all day. I sent him off on Saturday morning to collect the people, and I followed with a view of having my labour force numbered and re-organized.

I found the total muster-roll of the estate amounted to 264, men, women, and children, but of these sixty were away as porters and fifteen others missing, so that the number available was only 189. I directed Ali bin Jumah (whom I shall call Ali henceforward) to inquire after the absentees, while ten of the trustiest men were appointed watchmen, one to each

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shamba, and armed with an Enfield rifle and six rounds of ammunition; I offered a reward of five rupees for the first thief caught red-handed. I then paid a second visit to the Wanika village to see M'Doro the head-man, and to remind him of his promise to send his people to work.

Old M'Doro came to return my call in the afternoon, and asked for a present for himself for supplying labour. I told him he would get it all right if the labour was plentiful. I then went down with Ali to the lower shambas to re-organize and set matters straight there.

I took up my quarters in Shamba M'Pandiani, where I found the water supply very good on the whole; it was obtained from water-holes in a sugar-cane patch, which were always full, the Magarini people, when their own supply gave out, sending down here for it, as did also the people in the neighbourhood. Having settled things down here, I returned to Magarini, pausing on my way to watch some natives clearing land for sim-sim; a small hoe (costing four annas) was the only implement they used.

A day or two afterwards the sick-list that came up for treatment comprised only one case of dysentery, one of cough, and one of ulcer; and to save some of my time I resolved to instruct Ali bin Jumah in the art of doctoring his work-people in future.

I again sent word to the Wanika village for people to come to work, but as the head-man was absent none came. However, M'Doro came next day and apologized, promising to bring twenty Wanika on the morrow; but he disappointed me again, and it was not until a week later that I got any. The Liwali of Mombrui, from whom I had a visit at this time, proposed to tell the Wanika that unless they worked for me they would have to clear off the property and settle elsewhere, but I thought it better to try a little patience first.

The first thief was caught, and brought before me on August 6; he was a boy, detected in the act of stealing a sugar-cane. The offence was a very venial one, but to keep my promise, I paid the watchman the promised reward of five rupees, and gave the boy a good talking to.

Having to see the Liwali of Melindi concerning various

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matters, and wishing to travel by the Wanika road so as to see that part of the country, I sent for some of these people to show me the way. At first they refused altogether, but after a long and troublesome "shauri" (as they call a conference) they at last consented to come and carry my things for a payment of three annas a day and "posho" (food allowance) for each man there and back.

Next morning I set out for Melindi with four Wanika carrying my loads; my interpreter, a cook, and two boys, passing through the two Wanika villages on the way. M'Doro and the other head-man came out to apologize for not having sent the people to work, and again promised to send them, so I hoped it would be all right now. After leaving the villages we followed a steep narrow path down the hill, which gradually sloped away into the plain.

Reaching the level, I crossed a large, flat, grass field, the path being slippery and sticky, from the swampy character of the land, which I was told was all under water in the wet season. We then ascended an undulating piece of ground with short grass and clumps of bush, descending on the opposite side into another flat grass swamp. In fact the country showed alternations of partly dried swamps, with rising ground presenting a park-like appearance, and covered with short grass and clumps of bush. The soil was everywhere black and good, and in the swamps was invariably black sticky clay.

In passing through some thickish bush, I noticed for the first time hippopotamus tracks. Just beyond, we entered a Wanika village, protected by a strong palisade of posts; the village (Swahili, "*Mdi*") was called *Makungo Wazim*, and the head-man, Mahawa, told me that I was the second white man who had passed that way. I bought three wild duck from him for eight annas, and was told they abounded in the neighbouring river, and that the people snared them. They also offered me a heron for sale, which I declined. On the other side of this village flows the river Jorori, a small stream which winds through flat, swampy grass-land. It dries up during the hot weather, but just now, owing to the rains, was pretty full. I had to cross it twice; the first time the passage

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A WANIKA HUT.

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was comparatively easy, and I was carried over on the shoulders of my boy and the interpreter; the second time the stream was wider, and waist-deep; my people stumbled in crossing, and of course I got ducked. Between the two crossings the path led through high grass, and the soil presented the usual black clayey appearance; on both sides of the path were numerous traces of hippopotami, which frequented the place at night.

For half-an-hour's tramp the country was again park-like in appearance, with short grass, and clumps of bush as before, the soil throughout black clay.

We emerged once more on the banks of the Jorori river, where it was from 30 to 40 feet wide, although, as I have said, it quite dries up in the hot season. Leaving the river we climbed up a steep bank by an extremely bad path past an old Wanika clearing, and then for a good hour tramped through high grass quite above one's head and overgrowing the path, which was a mere track. In the distance, here and there, were a few Wanika metamah clearings. On the edge of the grass-land we passed some clumps of dum palms, called by the natives "makome," also "makoche." In the distance these trees much resemble coco-nut or palmyra palms, the only difference being in their branching stems, often from three to five, very tapering and slender, and crowned by a bunch of large feathery leaves. This is the tree, I was informed, from which the slaves on the runaway settlements draw toddy.

At 10 a.m. we came upon cultivation again. The path now led through a succession of sim-sim and metamah fields. The sim-sim was particularly fine, the highest and best I had yet seen, some being in flower, but most of it already ripe. We reached the Sabaki at eleven o'clock, three and a half hours' marching from Magarini. I had breakfast here, and resting till one o'clock, crossed the river in a canoe. The other side consisted of steep up-and-down hillocks (whitish soil), and in the hollows were clumps of castor-oil plants growing wild. The path now led through flat grass-land. The same general features seemed everywhere to predominate; small clusters of huts being, as a rule, surrounded with patches of metamah,

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sim-sim, and "kunde" (beans), interspersed with bush and old cleared land. The tobacco patches were all small—this product did not seem to be largely cultivated.

Early in the afternoon I passed through a large coco-nut plantation, with sim-sim growing underneath; the trees regularly planted, generally at a distance of 30 feet each way; I noticed few vacancies. Another coco-nut shamba which I presently passed through presented pretty much the same appearance, the trees being regularly planted at the same distance apart. The next plantation was one of fine mangoes enclosed within a boma, and belonged to the Liwali of Mombasa; after passing it, the path led through uncleared bush until the sea-shore was reached at 2.30 p.m. Half-an-hour's walk along the beach brought me to Melindi, the whole journey having been done in a five-hours march. I spent the next two days in Melindi on business, then returned by another route to Boma-Upandi, after again passing the Liwali of Mombasa's mango shamba. Here I branched off and passed through an Arab's neglected and grass-grown coco-nut plantation, then through clumps of mangoes, sim-sim, metamah, beans, and bush, the soil being everywhere of black friable loam.

The more I saw of the country, the more I was impressed with its adaptability for *cotton* cultivation. The black soil and freedom from stones, and the easy nature of the cultivation, would all be points in its favour which might induce the natives to take it up. Cotton, being a permanent product, requires but little attention; the people could easily pick and store it in their own houses for eventual delivery at Melindi, where a hand-press might be kept for baling. These remarks may also apply to *tobacco*, which could be much more extensively grown than at present, the leaf being purchased from the people and cured in central depôts, as is done in Sumatra. I reached the Sabaki river in one and three-quarters of an hour from Melindi. The country on both sides is steep and hilly, and the banks are high, and from this point I obtained a good view of the country with Mangea Hill in the distance. I had to wait half-an-hour at Salim bin Abdulla's ferry for the ferry-man, the river here running very

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VIEW FROM MAGARINI HILL—LOOKING SEAWARDS.

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deep and strong, and in heavy rains overflowing its banks on both sides. Lower down a school of hippopotami were floundering about and snorting. After crossing, we climbed up a steep bank of metamah and past a swamp, over which was a most primitive bridge, simply a number of loose sticks thrown pell-mell lengthwise across supports. The path now led by a village or group of slave-huts which were surrounded by coco-nut and mango trees and fields of sim-sim, rice, and bananas. I finally reached Shamba M'Pandiani one hour after leaving the Sabaki, so I made the journey of twelve or thirteen miles in something less than four hours. I afterwards found this to be the best road, as it passed almost entirely through cultivated land, was nearly direct, and, with the exception of the Sabaki river, there was no water to cross.

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## CHAPTER III

### FIRST EXPERIENCES ON AN EAST AFRICAN SHAMBA

Preliminary Troubles—Incendiarism—A Refractory Native—A "Shauri"—An Encouraging Change—A Valuable Ally—My Wanika Labourers—Agricultural Seasons—Seed-time and Harvest—Various Products—A Large Muster—Daily Routine—Harvesting Bananas—Natives' Dislike of Rain—A Reformed Character—Visits of Inspection—Site for Experimental Nurseries—A Good Start—Proposed Tour up the Sabaki—Preliminary Arrangements—Final Instructions—Personnel of my Party—First Night in Camp.

I FOUND Ali bin Jumah at M'Pandiani. He had been round all the shambas as instructed; the results were not much, but showed him to be hard-working and obedient. He had measured the shambas, but his measurements were not of much use, and he simply gave me a list of the various products growing upon them, which I knew before. However, he showed a willingness to carry out orders as well as he could, and this was something in his favour.

Ali suggested that the people should be kept working simultaneously on all the shambas, but this I negatived, and ordered that the weeding of the shambas should commence in earnest next day, each one being taken in turn, thoroughly cleaned and put to rights, after which all the growing trees were to be counted, so that we might have an exact knowledge of what each shamba contained. I directed Ali to begin with Shamba Baraka and to send all the people up there, except the watchmen and those guarding the metamah from the birds. Ali informed me that the sim-sim at Magarini was now weeded. He obtained permission to reside at M'Pandiani shamba as it was more central for his work.

It rained during the night, and the morning was wet. The



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workpeople, in number forty-three, went off to Shamba Baraka at 8.30. The Wanika did not turn up, and later in the morning M'Doro came again and made excuses, promising faithfully that they should come next day. I was obliged to content myself with the hope that it might be so.

I ordered thirty or forty hoes to be got for the Wanika, and arranged for one of the watchmen to act as head-man and look after them. Twelve of them came next day; they straggled in by twos and threes, the first lot coming about eight o'clock and the last about nine. I put them to weed the cotton. They were knocked off at eleven o'clock for mid-day meal, and at one o'clock not a single one had returned. I was obliged to send off a watchman named Bakari to hunt them up in their village, and they straggled back at about 2.30 p.m. I was not disposed to be exacting on the first day, and paid them myself at 5 p.m. Next day twenty-eight came—a decided improvement—they came earlier, and returned about 2 p.m. in the afternoon. When I went over to Baraka shamba on the first day of the weeding, etc., I was much pleased with the work done. They had hoed up a considerable portion of the ground, the bananas had been trimmed and the old stumps uprooted. In the afternoon an occurrence took place which illustrated the demoralized state of the people. The high grass and bush was fired by one of the people, on purpose, so the man being brought to me in the evening I warned him that I would have him punished. Fortunately the fire was put out before much damage was done. The man who reported that it was extinguished was so insolent in his behaviour, repeating his insolence before a number of the others, that I sent for Nakoa Feruzi, and told him that I would send the offender to the chain-gang at Melindi, his insolence having been so public and repeated, that I considered an example necessary. In the evening Feruzi asked me to forgive the man, but I refused. Next morning he renewed the appeal, but I remained firm, and was pleased to see that my determined action had made an impression.

I continued my usual muster of the sick, whom I had told to attend every morning and evening for treatment. Coughs,

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dysentery, and bad ulcers were the prevailing complaints; and later in the evening I went to the lower village to see a man who was extremely ill from lung complaint.

At about 9 a.m. the Liwali of Mombrui came to see me by appointment, and while waiting the arrival of the Wanika head-man, who had been sent for, we had a very interesting conversation. I liked him extremely, and he was of the greatest use and help to me in many ways. When the Wanika arrived the Liwali spoke to them for a considerable time about sending their people to work. An African conference (or "shauri") does not seem possible without endless talk, and on the present occasion the head-man M'Doro took a leading part. He said the pay I gave was not enough, and asserted that at the late interview with Mr. Bell-Smith, the Liwali of Melindi, and myself, I had promised to pay four annas a day. This being disposed of, they next demanded thirteen pice for the men; but this I refused to give. The interview lasted fully two hours, and I thought nothing would be settled, but at last an agreement was come to that the pay was to be the same as before, that I was to find the tools, and that the head-men should receive a present monthly, and that the hours of work were to be unaltered, the Wanika promising to come all together in the morning. I also thought it an encouraging sign that they asked permission to clear some of the bush close by for their own use; this permission I gladly gave them, for the more the Wanika settled round the place, the better would be the labour supply. The head-men asked to be excused for not sending many people just then, as they had their own cultivation to attend to, but in the dry weather I was promised any number.

On the whole I regarded this arrangement and interview as very important; there were fully fifteen Wanika head-men present, and the greatest praise was due to the Liwali for the trouble he took, and for the tact and patience he displayed in interpreting my wishes. In the afternoon I again visited Baraka shamba, on which there had been eighty-six hands working; they had done a good deal, and the cleared portion presented quite a different appearance. By ascending an ant-hill, I was enabled for the first time to see the whole of

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ALI BIN SALIM, LIWALI OF MOMBRUI, AND HIS BROTHER-IN-LAW.

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the shamba; it was extensive, and surrounded on all sides by a good fence. The principal products in it were coco-nuts, mostly four years old; bananas, patches of sugar-cane, and a little metamah and rice of indifferent quality.

On the morning of August 17 as many as forty-four Wanika came to work, and I put a number of them to cut some drains in the cotton land. To my surprise the soil was so wonderfully free and friable that it was easily worked with the light Wanika hoes; the earth cut like cheese, and I was more and more struck with the total absence of stones. When cut, the drains pleased me very much, and they were probably the first ever made in East Africa. The Wanika were working better every day now, but there was great difficulty in getting them to come back regularly in the afternoons.

The man I had visited in the lower village, and who had been bad with chest disease, died; and most of the people attended his funeral. I now instructed Ali bin Jumah to make arrangements with a native doctor to attend the people for diseases which I could not treat, whilst I continued to do as much as I could with the medicines at my disposal.

I took every opportunity of obtaining information concerning the products and cultivation of the country, and the results of my inquiries may here be briefly stated.

*Agricultural Seasons.*—The two agricultural seasons on the coast-lands correspond with the advent of the S.W. and N.E. monsoons, being known locally as—

*The Greater Rains*, or "*Masika Mku.*"

*The Lesser Rains*, or "*Masika Mdogo.*"

The *Greater Rains*, inaugurating the most important cultivating season, commence in March, with the heaviest fall in April and May, and continue with diminishing force to September.

The *Lesser Rains* commence in October and practically end in November, as, though the wind continues to blow steadily from the N.N.E., the rain-fall in December, January, and February is slight and uncertain, and it is during these three months that the greatest heat prevails, in January and February especially.

The sowing of the principal food grains, such as *millet*, *maize*,

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and *rice*, though I have known it as early as March 7, usually begins about the middle of that month, and is finished by the first week in April, though the re-sowing for failures and seed damaged by insects, rats, etc., continues till the end of the month.

Harvest takes place in July and August, and when once the grain is off the field, the land is immediately prepared for re-sowing in anticipation of the coming of the "lesser rains,"

COCO-NUT TREE.

which is the chief season for sim-sim, bean and pulse cultivation.

Now as to the principal products—

*The coco-nut tree* begins to yield the fifth year from planting, and is in full bearing from the seventh to the tenth year. The average planting distance is generally from 30 to 40 feet, and I was particularly struck with the great regularity of the trees in the various plantations that I had seen, which were usually surrounded with a strong thorn fence.

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While the trees are young, cassava or other ground produce is grown between them, and a favourite practice on many shambas is to plant bananas in conjunction with the coco-nuts. The trees are never manured, but owing to the fertile soil bear largely, averaging from seventy to two hundred nuts a year, and in specially favourable situations up to three hundred.

Notwithstanding the large number of plantations, no nuts appeared to be exported. The only attempt at cultivation that I saw was the banking up the stems of the trees with weeds and rubbish and hoeing away the grass, etc., for a distance of 4 to 5 feet round them. I was struck with the small number of dead trees, considering how extensively coco-nuts are cultivated in the district. A beetle, the same probably as the Indian coco-nut black-beetle, does damage, however, by eating the young leaves, trees so attacked presenting a ragged appearance.

Neither the *copra* nor *fibre* are exported, the husks being thrown aside in heaps as useless—coir rope being imported from Lamu. The steps cut in the trees for climbers extracting the toddy are also peculiar to this country—toddy being used simply for drinking or making vinegar. Comparatively little oil is manufactured, and is chiefly used for burning, but since the importation of kerosene oil by the Indian merchants the latter, owing to its cheapness (a tin costing from two and a half to three rupees), has in a great measure taken the place of the coco-nut oil.

The price of coco-nuts per thousand averaged from twelve to fourteen dollars.

*Bananas* form a favourite fruit, and are largely grown both in open fields and in fenced shambas, the clumps being planted in rows generally 10 feet apart. The price varies according to the quality of the fruit, a bunch averaging from three to four annas. Bananas being so plentiful, it struck me that it would pay well to export them to Mombasa, where they are scarce and dear, a single fruit selling there for three pice, and a bunch for one rupee.

Two varieties of *millet* are cultivated (*Sorghum vulgare* and *Pennisetum typhoideum*), forming with *maize* and *cassava* (*Manihot utilissima*) the principal food of the people.

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Of millet or metamah, a good deal is exported to Muscat, a regular trade with dhows existing between that place and Melindi, the vessels arriving when the harvest is over to ship the grain. It is largely cultivated, and I often noticed fields of it fully 12 feet high. The average price per gisla ( = 360 lbs.) was three dollars, but when scarce it rose to four dollars. The grain is crushed for consumption in small stone mills, consisting of two stones overlapping one another, the upper one being turned by a small iron handle let into the stone.

*Rice* is much valued, but the uncertainty of the rain-fall makes it a hazardous crop to grow, and it was only occasionally that I saw a really good crop; generally it looked yellow, ragged and dried up, but when the rains had been favourable, I have seen fields of it 6 feet high and loaded with grain; this however is exceptional, the usual height being 3 to 4 feet. No irrigation is carried on, but it is usually grown at the bottom of small swampy hollows, only one crop being grown in the year. No use whatever is made of the straw—which is left on the ground. Rice is generally sold in small mat baskets, holding, I believe, one frasila, and called "guniah," the price being one and a half dollars. The price of Indian corn, or maize, of which the local name is "mahindi," was from two to two and a half dollars a gisla.

The *harvesting* operations were simple in the extreme, and take place generally in July, August, and September. When the grain is ripe, slaves are sent in who cut off the ripe ears with a knife; these are collected in baskets and then emptied on palm mats (imported from Lamu) to dry in the sun; they are then beaten with ordinary sticks, and after drying in the sun for one or two days the grain is stored in sheds. The long stalks of the *sorghum* or metamah are used for making walls of houses and sheds as well as for fences.

*Sim-sim*, or *sesame* (*Sesamum indicum*), yielding the gingelly oil of commerce, is the most important product on the coast, and two varieties are grown, the white and the black. It is extensively cultivated and exported both to Aden and Muscat. It takes five months from the time of sowing till the crop is ready for harvesting, and two crops are generally grown in the year. When the pods are fully

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BETEL-NUT PALMS.

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formed, but still green, the sim-sim, then about 4 to 4½ feet high, is uprooted, and after lying on the ground for one day, is tied up in stooks, three or four supporting each other, and thus left to dry for fifteen days; this causes the pods to open, and the seed, which is very minute, is shaken out on to mats. The seed is then crushed locally in mills very similar to the Indian and Ceylon chikku oil-mills, only here they are driven by camels instead of bullocks. The oil is largely used by the people for cooking and anointing their bodies, the price of a cupful being one pice. The prices average from three to five and six dollars a gisla.

The following particulars may be of interest—

In millet or metamah cultivation only two shoots are left in each hole, the remainder being either transplanted or destroyed. Only two weedings of metamah are considered necessary from the sowing to harvest.

Rice seed takes ten days to germinate. Sesame seed will germinate in four days from sowing.

Only the bitter variety of *cassava* appeared to be cultivated. It forms an important article of local consumption, it and maize being eaten roasted and ground.

A basket of cassava of from 50 to 60 lbs. sells for four to five annas.

Beans and pulse at from two to three dollars a gisla.

*Sugar-cane* is here a permanent product; land once planted remains so, and it is cut every month all the year round, and the stumps are allowed to shoot up again. A sugar-cane stick 4 to 5 feet long sells for about a pice. The brown and white sugar sold locally is all imported, none being made here, and the only attempt at manufacture that I heard of, was that of Suliman bin Abdulla already mentioned.

*Pineapples* are cultivated to a small extent for their fruit alone; they grow well.

*Tobacco* is not extensively grown along the immediate coast-land, and so far I had only noticed small patches here and there, generally near slave houses. All the plants that I saw, though growing without any particular care or attention, were luxuriant enough. The leaf, very dark-coloured, is hung up in the roofs of houses to cure. The tobacco is strong

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and pungent, and is chiefly used for chewing and snuffing. The Wanika also cultivate it. The price appeared to be seven rupees for 35 lbs., or one rupee for 5 lbs.

The only *Betel-nut palms* that I had seen were those growing in Suliman's shambas, and considering the extreme suitability of soil and climate, I was surprised not to see more of them growing. The nuts sold at about twelve for one anna.

*The Silk-cotton tree* (*Eriodendron anfractuosum*—Swahili name "msufi") is indigenous to the country and grows to a large size; a limited demand exists for the cotton-pods, which are used for stuffing pillows. A silk-cotton tree is said to yield on an average about a frasila of cotton a year, the price depending upon the demand at the time, but sometimes standing at one rupee for 10 lbs.

The country evidently suits the *Mango tree* remarkably well, for nowhere have I seen it growing with greater luxuriance. It abounds everywhere, both in fenced shambas and scattered about the open country, and there are several varieties specially noted for the quality of their fruit, some of it very large. The average rate for small fruit was six to eight for one pice, larger ones two for one pice.

Of fruit trees, the various species of *Citrus* grow particularly well and bear largely. All the orange trees I saw were handsome and well grown, and the fruit commands a ready sale, two for a pice.

The Jack tree (*Artocarpus integrifolia*), though growing well, is not plentiful; the seed is an article of consumption, and is sold locally.

The Papaw (*Carica papaya*) abounds, and its fruit both raw and cooked is much consumed; the green fruit boiled makes an excellent vegetable.

I found the hardy and quick-growing *Castor-oil plant* (*Ricinus communis*) growing wild everywhere, but little use is made of its oil except by the Wanika.

The chief vegetables were pumpkins, beans, and pulse ("kunde"), Congo pea (*Cajanus indicus*), and sweet potatoes (*Batatas edulis*).

I should also mention that amongst the grains, *Ragyg*

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(*Eleusine coracana*), locally known as "wimbe," is also grown, but to a more limited extent.

On the morning of August 18 my muster of Wanika numbered fifty. After setting them to work I started off for Shamba Kozi, where the rest of the hands were then employed.

The want of a good road between Mombrui and the shambas being much felt, I resolved to speak to the Liwali and see if we could not arrange to make one. On arriving I found Ali and the people, excepting a few gathering bananas, all engaged in harvesting the rice, the amount of grain obtained being thirty-six baskets. I took this oppor-

PRINCIPAL FRUIT AND FOOD STUFFS OF THE COAST-LANDS.

tunity to go carefully over the shamba, and found it chiefly planted up with bananas, all the clumps being placed in rows as I have described. The rice-field was swampy, and adjacent to it were some patches of sugar-cane. Coco-nuts were planted every 30 or 40 feet, but these were nearly all young, only about fifty being bearing trees.

It was, taking it altogether, a valuable shamba, and the bananas should have yielded a large supply of fruit, but like Shamba Baraka it was sadly neglected and overgrown everywhere with thick grass and bush. I instructed Ali to keep half the people next day to finish weeding and clearing it thoroughly. One or two light ploughs would have been



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of the greatest use, and would have saved much time and labour.

In the afternoon I went to have another look at Shamba Feruzi, or as it was more commonly called Awalthi, this time going right round and all through it. This plantation is noted for its coco-nuts, many of the trees yielding up to 300 nuts per annum, and shortly before my arrival 7000 nuts had been gathered here! I counted the nuts on some of the trees, and found on an average from sixty to seventy. All the trees were from seven to ten years old, and covered the whole extent of the plantation.

When I returned to Magarini in the evening I was much

WANIKA LABOURERS.

satisfied with the work done by the Wanika, which showed a noticeable improvement every day. Next morning forty-nine of them came to work. It was wonderful how quickly they picked up information, and I hoped that with training they would become a useful labour force. They were obedient and good-natured, and I believe honest, and it was surprising the work they were able to do with their small hoes. At first I thought it better to let them work with the tool they were accustomed to; later on I meant to train them to use English implements, and they were so docile and adaptable that I anticipated no difficulty.

As I was now getting about fifty daily from the two

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villages in this, the busiest season for cultivation, I was encouraged to expect that by steadily continuing the experiment the people would gradually grow accustomed to regular work. Cotton cultivation I thought the most suitable for such beginners; from the clearing of the bush to the lining, holding, planting, weeding, picking, cleaning, and drying, it was all comparatively simple work, and I also adopted this plan from the consideration that, apart from gradually accustoming the Wanika to regular work, it was also a means of introducing a product for which in my opinion the country and soil were so well adapted. I found on again visiting Baraka shamba that Ali bin Jumah had been working his people very well, a good half of the shamba was now weeded, and no less than 260 bunches of bananas had been gathered; this was most satisfactory. I wrote to our agent at Mombrui to send up camels to carry them down to the coast, the camel hire being only eight annas for each trip.

The Wanika now came in greater numbers than I required, a fact which much gratified me, and I felt quite proud of my new labour force. I set some of them to clean up round the well, and to build a shed over it for protection against evaporation by the sun—an example I hoped to see adopted by the Swahilis. The hole-cutting became more satisfactory every day, and was soon nearly finished.

Two days afterwards Ali bin Jumah came to inform me that altogether 560 bunches of bananas had been gathered from Shamba Kozi, and that nine camels had arrived to convey them to the coast for sale. I was also pleased to receive two loads of iron for making hoes, and there were still two more loads at Mombrui.

On Saturday, August 22, squalls of wind and rain blew all day from the south-west. Only six Wanika came to work in the morning and three in the afternoon—they do not like rain! The man I had put in irons for insolence, having served his time, came back from the coast begging for forgiveness; I hoped that the lesson had been effective, so I took him back, and he proved ever after one of my best men. The next day being fine, sixty-four Wanika came to work,

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and were all put to cotton-planting. I again went to inspect Baraka shamba, and on my return I found that the head-man in charge of the Wanika had managed the work so badly, that I threatened to send him back to his duty as a watchman if he was not more careful, and I put a Wanika to look after the "lining" boys. He did his work so well that I picked out two others, and told them I would put them in charge of certain works and raise their wages if they did well. I found this arrangement so satisfactory that I continued it.

On the morning of the 25th I started off to visit all the lower shambas. I first inspected Shamba M'Tusi, also called Feressi; it was bounded by Shamba Abedi on one side and by a belt of fine mango trees on the other; it was scattered, and all open cultivation: rice, sim-sim, metamah, bananas, mangoes, and coco-nuts. The soil was remarkably rich, and well adapted for the cultivation of tobacco. Shamba Saraboko was open on three sides, and on the fourth were rows of fine mangoes, planted very thickly and closely together, the rest being taken up with luxuriant clumps of bananas, while scattered among them were many young coco-nuts, two sugar-cane patches, some sweet lime trees, and two clumps of bamboos. The shamba was overgrown like the others. Under the shade of the mangoes was a capital place for the cultivation of pepper, whilst the open spaces were admirably adapted for the experimental cultivation of various products.

Shamba Nghanima, comparatively small, was contiguous to Shamba Saraboko, from which it was divided by several rows of fine mango trees. This shamba had no ground produce, and was also much overgrown.

Shamba M'Pandiani, so frequently mentioned, was the largest and most important of all, containing, next to Shamba Awalthi, the most valuable coco-nut plantation on the estate, the trees all mature, planted 20 by 30 feet apart, all vacancies being carefully filled up with young plants. Here also were about thirty-nine or forty very fine betel-nut palms. Except for a fine patch of sugar-cane there was no ground cultivation. A good deal of "ilook" grass was growing in one part.

The water supply here was excellent and permanent; I

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therefore decided that this was the most suitable place to establish my nurseries for my new products.

Separated by a thorn fence was Shamba M'Selm, a small portion of which was planted with young coco-nuts, and much-neglected bananas growing underneath. There were some small patches of sugar-cane, but the chief cultivation consisted of many rows of fine mango trees, with open sheltered spaces between, well adapted for the cultivation of tobacco. Shamba Kitanga Kekubwa was another fine plantation, consisting chiefly of mango trees planted closely together, and containing also many coco-nut, orange, Jack, sweet lime, and custard-apple trees, and some pineapples. Shamba Abedi was another coco-nut plantation of mature and young trees, a few mango trees, a large number of bananas, and a good deal of cassava. This shamba was terribly overgrown with bush and grasses, and required thoroughly cleaning and doing up.

I had now got the plantations in thorough working order, over a thousand bunches of bananas had been sent down on camels to Mombrui, steady progress was being made in the weeding and cleaning up, whilst the metamah harvest was to be begun immediately, and to be followed by a regular and systematic gathering of the coco-nuts from the various shambas. The Wanika were going on admirably under the supervision of their own people, controlled by one of the Nakoas. The cotton-seed had made a start and was germinating well, so I thought I might leave Ali bin Jumah in charge whilst I proceeded to my other duties of visiting various portions of the district.

During the brief visit that I made to Melindi, to talk this matter over with Bell-Smith and the Liwali, it was suggested that I should make a preliminary tour up the Sabaki river to the runaway slave settlements at Makongeni, and the upper reaches of the river, returning to the coast at Takaungu, and thence proceeding to Melindi, visiting first, however, the Orchella Weed districts at Marereni by way of Nasur bin Suliman's plantations and the town of Gongoni. I looked forward with interest to this expedition, as affording me a much-wished-for opportunity of seeing more of the country and judging of its capabilities; but meanwhile several matters

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required my attention, and it was not until September 9 that I was able to leave Magarini.

I had first to visit and thoroughly inspect Nasur bin Suliman's shambas, situated about an hour's walk from Magarini, and beyond the village of Boma Upandi. On arriving I ordered the Nakoa to have all the people mustered next day for formal registration; and in the morning I counted them. There were only twenty-two men; ten of them had gone off to Lamu to work as porters. I afterwards went round the property with Nakoa Tofike. It consisted of open land extending in a complete circle round the boma, this land being very rich, and having quite a name in the neighbourhood for the quality of the sim-sim grown upon it. Most of the soil was of a friable chocolate loam.

The greater part of the land had been let by the Liwalis to various neighbouring cultivators who had crops of sim-sim growing upon it. They paid from one to three rupees according to the size of the patch taken, and were liable for this rent whether their crops proved remunerative or not.

As I went round I passed a field of sim-sim which was being harvested, and I examined the process with curiosity. Nasur's was the only land out of cultivation, all the neighbourhood, right up to the boundaries, being extensively cultivated, chiefly with sim-sim, for which the soil seemed particularly adapted. Hardly any enclosed shambas were to be seen round here, the cultivation being all open, and I was struck with the entire absence of coco-nut trees.

Growing round two sides of the central boma was a fine plantation of mangoes, lime trees (bearing very heavily), guavas, custard-apples, some good varieties of oranges, and pomegranates.

The estate consisting as it did of open fields, it seemed to me, that in the absence of modern agricultural implements it would be impossible to work it profitably with the small labour available, and that the best plan would be to work it and Magarini conjointly, sending labour over whenever cultivation required it, Shamba M'Pandiani being only three miles off. The crop of lime-fruit was so large, many rotting

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on the ground, that I put some people on at once to gather and despatch it to Mombrui and Melindi.

I then returned to Magarini, and for the next two days we had a good deal of rain, which was of much benefit to the young cotton plants, as they were now shooting up everywhere. The sowing of cotton-seed was finished by September 2, and I then put on the Wanika to clear up the old cotton-land till the 5th, when all being completed I paid them off for the present. I sent for their head-men and informed them that, though the approaching dry season now compelled me to discontinue work, I hoped to begin again in a few months, when I should require a larger labour supply. I made them each a money present in return for sending their people to me. I also told them that I proposed starting on a tour on the following Monday, this being Saturday, and that I wanted some Wanika to come as porters, that I would pay two annas each daily with a like amount as "posho" (batta for purchasing food). M'Doro was to come next day, when I would tell him the exact number I required.

I had a very busy morning, going into the accounts of the property with Ali bin Salim, the Liwali of Mombrui, who, with the estate agent, Omar bin Abid, had come up for the purpose of arranging for the gradual paying off of the claims of the poorer creditors.

Ali bin Jumah then came to receive his final instructions as to the work to be done during my absence. Ali expected the metamah harvest would be finished in about another fortnight—he was then to store the grain (carefully measuring it to guard against theft) and keep it carefully until my return; then the coco-nuts were to be gathered and despatched to Mombrui, either by the shamba donkeys or by camels, according to quantity. When no other work was in hand they were to go on cleaning up the shambas. A few people were to be told off for gathering the cotton when necessary, and when the young plants were about 4 inches high, they were to be thinned out, leaving only three to each hole. Ali was also to take charge of Nasur bin Suliman's shamba, and to send help for cutting the metamah and sim-sim whenever ripe. Next year we proposed growing only the most

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remunerative ground and grain crops, so as to obtain returns as quickly as possible. Ali seemed thoroughly to understand my orders, and I told him that the state of the shambas on my return would prove what he could do. The Liwali of Mombrui also promised to keep an eye on everything during my absence.

I was much pleased on telling M'Doro on Sunday evening that I should require ten of his men the following morning to carry my loads, that one of the late Wanika overseers who had come with him immediately volunteered, and offered to bring some of his friends with him.

I was very busy all day Monday packing my things, and storing away what I was leaving behind.

I left Ali bin Jumah well supplied with all necessary medicines, and finally started on my expedition in the afternoon, my first destination being no further than Nasur bin Suliman's shambas, where I had some small business to transact.

My party numbered fifteen, composed as follows—

Ramazan, my interpreter, who was also head-man in charge of everything.

My cook with two boys.

Ten Wanika porters, including two of my late overseers, with finally one Arab askari (soldier), by name Selim, whom the Liwali had sent me, a most reliable and excellent fellow and a capital hand at cleaning guns.

I had my tent pitched inside the boma of Nasur's shamba, and my first night in camp passed without incident, though it rained heavily.

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## CHAPTER IV

### GONGONI, RAS N'GOMANI, AND THE ORCHELLA WEED DISTRICT OF MARERENI.

A Polite Head-man—Cultivation—Rapid Growth of Silk-cotton Tree—Guniah System of Agriculture—A Primitive Telephone—Salt Deposits—A Sandy Waste—Scarcity of Firewood—Ras N'Gomani Fisher-folk—Shark's Flesh as Food—Abundance of Game—Mangrove Timber—Waiting for Canoes—Bad Marksmen—Shallow Back-waters—Casuarina Trees—Flat Grass Plains—Marereni—Orchella Weed—Great Heat—Elephant Tracks—Rich Soil—Back to Mombrui.

I STARTED about 7 a.m. on September 10 for Gongoni, my first stage, Ramazan and the Wanika striking my tent, rolling up my bedding and packing the loads, whilst I was having my morning tea. The people were a bit disorganized at first, scrambling for the lightest load, but they soon settled down, and I always found them very willing.

About an hour after leaving the shamba I arrived at Gongoni, having an intelligent guide sent by the Liwali. I camped in the town under the shade of some very fine silk-cotton trees. The head-man, who was absent on my arrival, shortly came in, and was most polite, bringing me milk, eggs, and a fowl. The people received me most civilly, and I held quite a *levée*. I here found one of the Wanika who had been my first guide to Melindi along the Wanika road, and he testified his feelings towards me by bringing me a present of eggs. The head-man, Mohamed by name, was a *Guniah*, as also were most of the people here.[1] I had several conversations with him, and he brought his little son to show him to me;

[1] The Guniahs, also called Bajoni or Watiku, inhabit Patta Island and the mainland north of Lamu.



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I gave him a small present. Let me now describe the country I passed through *en route.*

After leaving Nasur's shamba I passed through a flat plain, covered with a great number of baobab trees, growing singly or in pairs. The soil was rich, generally a light, sandy, chocolate-coloured loam. I saw neither coco-nut nor mango trees, but was informed that the Guniahs did not care for other cultivation than millet and sesame, not even cassava.

The land traversed was cultivated chiefly with metamah, which had now been all harvested. I passed only one enclosed shamba (which had no trees), and eventually emerged upon a richly-cultivated area, all open, consisting of metamah (some of it harvested), a good deal of sim-sim, and a few patches of beans close to Gongoni.

Gongoni is a fairly large native town, not protected in any way, but quite open. I had expected to find it on the sea-shore, but it is some distance from it. The houses were fairly large and looked comfortable, and the place was tolerably clean. The Guniahs keep herds of goats for milking, and many dogs, very similar to the Indian pariah dog. Gongoni appeared to be entirely dependent upon Mombrui, as it had no bazaars, and not even pice were procurable.

The head-man Mohamed and many of the inhabitants complained of the great scarcity of drinking-water. I visited their two wells, one outside the town, with very little and discoloured water, and the other much further off with a larger supply, slightly brackish but drinkable. They said the two wells dried up in the hot weather, so I suggested (as I had already done at Magarini) that they should build a shed over the well, first deepening it, to protect it from the sun; this they promised to do. In the dry weather they had to send as far as Nasur bin Suliman's shamba for water (an hour's journey, or say three to three and a half miles). One or two Europeans, they said, had told them they would find water in the centre of the town, where the water lay in the wet weather. I had a look at the place, and told them the experiment was well worth trying, though I could not guarantee its success.

I was struck by the appearance and size of the silk-cotton

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NATIVE AGRICULTURE: THRESHING AND WINNOWING METAMAH. (*From an instantaneous photograph.*)

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trees near my tent; they were fully 30 feet high, and the circumference of the largest a foot from the ground was 39 inches—the head-man told me they were only three years old!

Gongoni was surrounded on three sides by an extensive plain, bounded on one side by Magarini Hill and on the other by the low Mombrui Hills.

The Guniahs are great cultivators, and subsist chiefly on metamah grain, but a large acreage was also under sim-sim, some fully 5 feet high and most luxuriant in appearance. Their usual custom with new land was to first grow two consecutive crops of sim-sim, then a crop of beans (kunde), which they said had an invigorating effect on the soil; afterwards sim-sim was again sown and continued as before. Of metamah only one crop was grown in the year, and just before it was harvested either sim-sim or beans were put down, and this process was continued till the soil became exhausted, when a new patch of land was taken up; needless to say no manuring was done.

Some of the metamah fields I passed through were being harvested, men hacking down the stalks with long knives, women following them and cutting off the ears of corn and collecting them in baskets. I thought the wide plain would make capital ploughing land, and wished the people could see a plough at work—they would soon realize its advantages. Their light hoes merely scratch the ground and do not touch the rich subsoil. Besides the cultivation already described there were, I was told, some large shambas further away, the property of the Liwali and some rich Swahilis of Melindi; all open land under sim-sim and metamah.

The Guniahs appeared an industrious race, and ready enough to learn and adopt new ways.

In the evening I was rather amused to see some of the children playing with a very primitive telephone made out of two small empty tins, with a piece of skin pasted over one end, and the two connected with a long string. I heard the boy at the other end distinctly, and was rather surprised to find such a scientific toy in Gongoni of all places!

The weather was exceedingly hot (Friday, September 11), and after breakfast a good many people came to me and

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asked for cigarettes, cough medicines, etc., which I gave. Mohamed was reaping his metamah, and I tried my hand at cutting a few stalks. In the afternoon I made a rather important expedition; I had noticed to the south-west of Gongoni some white, sandy-looking patches with no cultivation, and on inquiry I was told they were salt deposits, and that the people obtained from them their supply of salt, so I went to visit the place, and passed through some of the strangest country I had yet seen. Nearly the whole way led through a sandy waste devoid of vegetation except a few islets of bush; the whole of this was flooded at intervals, waist-deep, with brackish water, probably sea-water. We then crossed a mangrove swamp, and then came upon a shallow back-water (then dry) running inland from the sea, and flooded only once a month at the high neap-tides. I followed this to the end over white sand, on which were tracks of hyænas, antelopes, and monkeys. Across this back-water in one or two places there were small barriers, about a foot high, for catching fish, made of stakes and grass. At the very end, which narrowed considerably, the sand was covered with patches of glistening salt left by the last tide. I was informed that after one of these high tides the amount of salt deposited was large enough to supply the whole of the neighbouring districts, even the Magarini people coming here for theirs. This salt deposit is about half-an-hour's distance from Gongoni. If proper salt-pans were made, as in India, the amount obtained would be considerable.

I returned to Gongoni by another route, passing over a low flat plain, which I understood was partly under water in the wet season. The soil was black and stiff, thick low bush extending around. I noticed growing here a good many fan palms and also euphorbias; the Guniahs use the milk of these last for killing fish by throwing it into the water. The dried branches also make good torches.

I left Gongoni for *Ras N'Gomani* (about two hours' distance) at 8 a.m. on September 12. The way was at first over the same country as that going to the salt deposits, then through a succession of sandy back-waters and mangrove swamps nearly the whole distance, and I again noticed many hyæna,

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THRESHING AND WINNOWING METAMAH. (*From an instantaneous photograph.*)

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monkey, and zebra tracks. I passed several parties of men with camels from Mombrui, coming to the mangrove swamps for firewood. On inquiring I ascertained that the coast-lands being now almost entirely denuded of bush, parties of men were sent either up the Sabaki river, or, as in the case of Mombrui, to the mangrove swamps, to obtain firewood, which was retailed in small bundles at one pice each.

Just before reaching Ras N'Gomani I entered a flat bushy country, with very white sandy soil. Ras N'Gomani consists of a small cluster of about ten huts, built on a creek winding far up into the land, with many inlets, and surrounded by mangrove swamps. There was no cultivation whatever, and the people, all Guniahs, lived by fishing. They possessed a few canoes, and one dhow, which had just come in bringing a large shark, the flesh of which was cut into strips and hung out all over the place to dry in the sun; they are fond of it as an article of food. I here made inquiries about Marereni, of which I had heard a good deal, and among other things was told that game abounded there—especially in wet weather—including water-buck, hartebeest, antelopes, any number of lions, rhinoceros, buffaloes, etc. The head-man said I could go to Marereni either across the bay by water, for it was impossible to pass through the mangrove swamps, or else by way of Gongoni, which would take five hours.

The askari Selim reported that there were antelopes in the bush around here; so in the afternoon I went off with him, taking my double express. I saw three or four antelopes, but did not get near enough for a shot; they were very wild. I had a long tramp of over two hours, and this gave me an opportunity of examining the bush thoroughly. It was much the same as elsewhere, but the soil was very light and sandy. I examined it in three different places, and found it to consist of very light sand mixed with black loamy particles. The lay of the land was gently undulating, with some low hills. Mangrove timber is exported from here both to Mombasa and Zanzibar, the bay being accessible to dhows at full tide. This mangrove wood (*borities*) is in much demand for building purposes, as it is very hard and durable, and white ants do not touch it. There is an enormous supply available.



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The Guniahs objected to the Wanika sleeping in their houses, so they came and slept around my tent. What with the fires they built to keep off the mosquitoes and the row they made talking during the night, I did not pass a very pleasant evening or quiet night. Next morning I found the bay full of water, and waited a long time for the head-man, who had gone to fetch his canoes, for I had decided to go to Marereni across the bay, and return by Gongoni to Mombrui. At last, at 8.30 a.m., I took a canoe that was lying on the beach, and sent off all my gear with Ramazan and three Wanika and a couple of Guniahs to pole it. While waiting for the other canoes, which took a long time in making their appearance, I put up a mark at about fifty paces and got the Wanika who remained to shoot at it with their bows and arrows. They made very bad shots, and on moving the mark to twenty paces they only hit it once! Then Salim started some gymnastics, jumping through his clasped hands, in doing which he touched his thumbs with his tongue; standing on his head; jumping and leaping; all of which the Wanika imitated fairly well. I finally started two Wanika "cock-fighting," to the great amusement of the spectators, who roared with laughter. This impromptu entertainment whiled away two hours; the canoes then turned up, and I set off with the remainder of my people. The water was so shallow that the two Guniah boatmen punted the whole way across; we then entered a series of winding and shallow back-waters which swarmed with fish—mangroves were growing everywhere, and we had to wind about a good deal to keep in the deeper water. After many intricate turns we at last emerged upon the sea-shore, a line of coral reefs dividing the back-water from the open sea; it had taken us over an hour to pass through from Ras N'Gomani.

On landing, I found Ramazan waiting with all the camp gear; we now proceeded along the sea-shore, which was lined with comparatively high bush; we passed large numbers of *casuarina* trees, some of very considerable size; it is a most valuable fuel tree. Two back-waters being reported ahead, we struck inland to avoid them, and passed through bush country, with here again a white sandy soil on which more

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casuarinas were growing. The country may be described generally as very flat, grass plains uninteresting in appearance, with a blackish clayey-looking soil, being interspersed with shallow, sandy back-waters. About half-way we struck the direct track from Mombrui to Marereni, and about an hour's march beyond the country was broken with low hills. The soil again became very sandy, and we saw more casuarinas, and further on we had to wade through a fairly deep creek. Around Marereni itself, which we reached late in the afternoon, marching was very heavy on account of the deep white sandy soil. Here we found a small stockade, garrisoned by five askaris, erected for the protection of the road and of the people gathering orchella weed. The stockade was built on a sandy hillock close to the sea-shore; opposite was a shed for the use of the orchella weed-gatherers.

After an hour's rest I took the guide and one of the askaris and went off to see the orchella weed. I crossed several low hillocks, and passed many casuarinas growing in the hollows. After crossing another shallow back-water I reached the orchella weed, which was growing on the bush trees in every direction, some, evidently deciduous, bearing a larger quantity than the others. It is gathered in the dry weather, and, apparently, can be obtained in any quantity; in fact, I was told that it extends for two full days' marches, *i. e.* forty or fifty miles beyond Marereni. I was able to gather about half-a-pound in less than half-an-hour. It looks like long grey lichen growing on the branches of the trees. There are *two* varieties, the long and the short (*Roccella fuciformis* and *Roccella tinctoria*), yielding a dye of a deep purple colour, the former being the valuable. The weed apparently prefers bush that is growing in deep, white sandy soil, and doubtless, with systematic and careful gathering, the quantity available could be largely increased. I was informed that for the last year or two there had been but little demand; previously the Indian merchants of Mombrui and Melindi had bought it largely for shipment to Lamu and Zanzibar. Guniahs appeared to be the chief gatherers of it; they come here in the dry weather when cultivation is at an end, and sell it to the Indian merchants at the average price of one and a half dollars a

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frasila. When in much demand the price rises to two and a half and three dollars a frasila.

I camped that night in the stockade, where there was an excellent supply of water from a well close by, a strong sea-breeze blowing all night.

Next day (September 14) we started off at 7 a.m. on what proved to be a very long day's tramp to Mombrui. After leaving the sea-shore, the country was very flat, mostly good short grass plains, with scattered clumps of bush, the soil blackish and dry-looking. I saw several zebra skulls by the path, and game was reported to be plentiful one day's march beyond Marereni—water-buck, antelope, zebra, lions, and I believe buffalo were to be found.[1] For three and a half hours I traversed much the same description of country as in coming; the heat here was very great, and I came upon all my porters squatting under some bush, quite knocked up by the heat and thirst. I myself was glad to get half a bottle of cold tea. We started again after a rest and reached Gongoni at noon, after five and a half hours' hot and fatiguing march, the latter part of it being through dry mangrove swamps.

I saw several elephant tracks, and these animals evidently come down here in the wet season. After resting about two hours at Gongoni we resumed our march to Mombrui, the intervening country being mostly rich land, the greater part under cultivation. The soil was of the usual chocolate-coloured. The cultivation consisted chiefly of sim-sim, mostly in flower, and some very fine fields of beans, the metamah having already been harvested. There was as usual a good deal of abandoned land, whilst towards Mombrui rose low hills covered with bush and grass. The time taken in marching from Gongoni to Mombrui was two hours, and I paid my Wanika double "posho," as they had behaved splendidly on our long and tiring march.

[1] Since the cattle plague the buffalo has become much scarcer in East Africa, so many having died from the disease.

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## CHAPTER V

### JELORI—THE GIRYAMA TRIBE[1]

Arab Hospitality—Shamba Accounts—Proceed to Melindi—Stalking a Turtle—Preparations for Sabaki Expedition—Start for Jelori—Fertile Country—Large Coco-nut Plantations—Mr. Weaver's Road—Sekoki Hill—The Sabaki—Lake Jelori—C. M. S. Station, Mr. and Mrs. Hooper—Exploration of the Lake—Giryama Villages—Sansevieria Fibre—A Hippopotamus Hunt—Village in the Forest—Shauri with the Wa-Giryama—Canoeing after Hippo—The Wa-Giryama and their Country.

ON arriving at Mombrui I proceeded to the Liwali's house, having sent Selim, the askari, on in advance to announce my arrival.

The Liwali was as usual most courteous and hospitable, supplying me with coco-nuts, milk, dates, and coffee, and insisting on giving me dinner. I had my bed put up in the room where I dined. While bathing before dinner, I noticed a very ingenious arrangement which the Arabs and Swahilis use; the bath really consists of a cistern built of stone and cement, which is fixed a few feet above the ground, and when you want a bath, you simply pull a plug out of a projecting spout and let the water pour over you.

The Liwali came early next morning and insisted on supplying my breakfast too—nothing could exceed his constant courtesy to me. Whilst talking he told me that he had discovered in the house of Nasur bin Suliman's wife (his property, like Suliman bin Abdulla's, had been forfeited, owing to his

[1] In Swahili the prefix *Wa* denotes the plural and *U* a country, as thus—

Wa-Giryama = the Giryama people.
U-Giryama = the Giryama country.



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having joined the rebel Sultan of Witu), a lot of things which her husband had left behind, the most important articles being a handsome silver-mounted dagger and a silver cartridge-belt. The others were, an Arab gun, a handsome black dress trimmed with silver, and some crockery and brass cooking pots, which I ordered to be sold by auction. Ali bin Jumah now arrived and reported everything going on well on the shambas. I then spent a busy morning settling accounts with the Liwali and Omar bin Abid. Afterwards Ali bin Salim showed me his new house. Hearing that the Liwali of Melindi had just arrived, we went to call upon him, and had coffee, sweets, etc.; he had come to arrange about a marriage between a girl of good family at Mombrui, and the Cadi, or Judge of Melindi.

I left Mombrui in the afternoon, marching along the sea-shore until we came to the Sabaki. No ferry-man being in sight, Ramazan volunteered to take everything and everybody across, and did so very well. I shot a big crocodile on the bar between the river and the sea, and on nearing the other side of the river we saw a turtle on the beach. We crept up most stealthily, and when close to it, made a sudden rush to turn it over, when, alas! we found it was dead!

On reaching Melindi at 3 p.m., I went to the superintendent's house, where I found that Mr. Keith Anstruther had succeeded Mr. Bell-Smith, the latter having been transferred to Takaungu. Next day I camped near Weaver, who had just arrived to meet some Indian coolies, who were expected by the *Henry Wright* next day. I received a message through the telephone, from the Administrator in Mombasa, that the original idea of sending Mr. Anstruther to accompany me on my Sabaki expedition must be abandoned, as he was wanted at Melindi; therefore I must go alone. Anstruther advised that as I was going up among the runaway-slave settlements, I should take five extra porters and five askaris. Weaver's twenty-five Indian coolies (from Kurachi) arrived next day; they were to work on the road which he was making to Jelori. I proposed going up by this place, then proceeding to the runaway slave settlements on the Sabaki at Makongeni, and if possible as far as the second stockade, on Captain Lugard's

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route; thence striking westward through the Giryama country and reaching the coast again at Kilifi or Takaungu.

I purchased supplies, sugar, kerosene oil, etc., for my journey. Anstruther most kindly gave five of his own porters together with the head-man employed to carry on trade and barter in the interior. This man knew the country I was to travel through, thoroughly, but he was in great fear of both the Gallas and the Masai, with whom he had had ancient disputes. His name was Jubah bin Fukir. The Liwali of Melindi also took a great deal of trouble and spoke personally to Jubah bin Fukir, telling him exactly what I proposed doing; and supplied me with a second head-man, named Baba, who also knew the country. Besides these I was taking four askaris, provided with one hundred rounds of ammunition. The two head-men had also guns, so that we were pretty well provided in regard to armament. I agreed to give each head-man four annas, the askaris ten pice, and the porters eight pice each a day, in addition to "posho," which I proposed to issue weekly. Having given them a week's "posho" in advance, I started at 2 p.m. on Sept. 16, with Weaver, who accompanied me part of the way.

The country traversed on the first day was exceedingly rich. I first passed through large fields of thriving sim-sim, some that had been uprooted and tied in stooks being fully 5 feet high. The soil was excellent, chiefly a friable, light chocolate loam, varying to grey loam in places. Beyond this I came upon what in the wet season is a small lake, called "*Zewah la Feruzi*"; its bed could be traced by the light green grass growing very plentifully. Further on I passed a coco-nut plantation, amongst which were some silk-cotton trees; then through some abandoned land, with some fine mango trees. The soil here was a sandy black, the country extremely flat and most fertile.

The path now led through a banana shamba, and a large field of Indian corn; then after passing patches of abandoned land, we emerged upon another large area of cultivation, sim-sim (second crop) and beans—the latter growing in lately harvested fields of metamah. This was succeeded by large coco-nut plantations, almost contiguous one to another, varied with a

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few mango shambas. My attention was especially directed to the largest coco-nut plantation that I had yet seen, it was some distance off on my right, and belonged to the Liwali of Mombasa, who owned a great deal of land here. This particular shamba extended as far as the eye could see, and the appearance of the trees was healthy and vigorous in the extreme. This was indeed a beautiful and fertile country; the soil was of a chocolate sandy loam, and as a coco-nut growing country could not be excelled.

Many native houses and several villages were passed on the road, and most had groups of silk-cotton trees growing around them. Further on—two hours after leaving Melindi —I came upon extensive fields of lately harvested metamah, now planted with beans, and all around were coco-nut and mango shambas. Past this was another phase of cultivation, where bananas, pineapples, and cassava grew luxuriantly, the last being especially fine. I passed through several large fields of it.

The country now gradually became broken and uneven. I crossed slight hollows which by degrees grew more marked, and eventually the land became undulating, with deeper valleys, which drained into two small lakes situated a couple of miles away. Latterly the country appeared less cultivated, and I passed through a good deal of bush. The soil here, especially in the valley, was blacker. At 5 p.m. I reached *Méré* shamba, situated about ten miles from Melindi, to the Liwali of which it belongs.

Indiarubber and gum-copal trees are to be found at *Aroboko*, two hours' distance from Méré, and large quantities of both were obtainable there, but nowhere else on the Sabaki. The rubber vines at Aroboko were said to be very large, as thick as a man's wrist.

Méré is chiefly a coco-nut shamba, and I particularly noticed a dwarf variety, from the island of Pemba, called "pemba," which appeared to be particularly valued, as it bears much earlier than the other kind. Beyond Méré shamba, yet still part of the property, I passed through some fields of young sim-sim (second crop), the soil being a black loam; then through a good deal of abandoned land, with mango

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trees scattered here and there—the soil still a black loam, now covered with grass.

There is a low hill called *Sekoki*, about three miles from Méré shamba, the country lying between consisting of a gently rising ridge with an intervening deep valley covered with bush and long grass and scattered trees, the soil being a friable grey loam. A large number of Hyphæne palms were growing in this valley, together with a variety of Cycad (*Encephalartos ?*) called "Makumwa" in Swahili.

I was now travelling along the track cut by Mr. Weaver for the high-road he was constructing from Melindi to Jelori. The road at first struck through a small cultivated area, chiefly of metamah lately harvested, and latterly through abandoned land which was now thickly grown over with guinea-grass (an excellent fodder grass and indigenous to the country). The soil was a rich red loam. The surrounding country I was informed was at one time largely cultivated, but the inland tribes, especially the Gallas, gave trouble, and the slaves got frightened and would not stop to work it. The bush at the foot of Sekoki Hill was much heavier than elsewhere, and the soil continued good.

Mr. Weaver had his camp on this hill 300 feet above sea-level, and distant about thirteen miles from Melindi. It commanded an extensive view of the rich and fertile plains below. On the top I came upon the first forest I had yet seen; it entirely covered the hill, and extended for a long distance to the southward, being, according to report, rich in indiarubber and gum-copal trees. The trees were growing closely together, some of them of fair thickness and height. The top of the hill was flat, and the new road, now a grand open way fully 20 feet wide, cut straight through the forest for a completed distance of over two miles, and reflected much credit on Mr. Weaver. This road when finished promised to be of great value in opening up the rich Sabaki district. Good roads and wheeled traffic are the great desiderata in this country.

I found Weaver busy putting up huts for the twenty-five Indian coolies he had brought up from Melindi the day before. I pushed on, and eventually joined the old road cut by Mr.

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Anstruther, still in a wonderful state of preservation. The well-worn footpath in the centre showed that it was appreciated and well used by the Wanika and Giryama tribes. Proceeding along this road through continuous forest, I obtained here and there, through openings in the forest, glimpses of the Sabaki river below winding through a flat country.

Great results would follow the opening up and settlement of this fertile and extensive area, in which irrigation from the river would be an important factor. Continuing through the forest, I commenced descending the hill, and obtained a fine view of the flat country to the north, with a few low bush-covered hills, and Magarini Hill observable in the distance. The Sabaki flows at the foot of Sekoki Hill; the river was then low, but the water-marks on the bank showed the height it rises to in the wet season. It flows over a wide sandy bed, and the soil of the banks consists of black sandy loam, covered on both sides with high thick grass, which is used by the Giryama people for thatching purposes. On the south bank I noticed patches of Indian corn planted by the Wa-Giryama, and proving, by its most luxuriant growth, the richness of the soil, which is of a black sandy loam. Tobacco should do exceedingly well here. Leaving the river I struck inland towards *Jelori* lake, passing through bush and scrub, with large trees here and there. The total distance from Melindi I estimated to be about eighteen or twenty miles. Lake Jelori appeared to be large, with numerous winding bays. The Church Missionary Society had a small settlement here, situated on one of the points of the lake, under the charge of the Rev. Mr. Hooper and the Rev. Mr. Burt, and they had a small colony of Christian Giryamas settled around them.

I arrived about 2.30 in the afternoon, two of my askaris having gone on in advance to announce my approach by firing shots. Halting my people outside, I went into the Mission ground, but hearing singing I waited until the service was over, and then sent on the head-men to announce my arrival. After a little while, Mr. and Mrs. Hooper came out to meet me, and cordially invited me to tea and dinner, and to spend the rest of the evening with them, Mr. Hooper kindly showing me a

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suitable place to pitch my camp. My Wanika growled at being sent to get water, saying that they were worked harder than the Melindi porters. I had a "shauri" with them on the subject afterwards. At 5 p.m. I went to Mrs. Hooper's to tea, and on the way met their baby boy, seven months old, being wheeled in a perambulator by its Sudanese nurse—it seemed an odd sight in the wilds of Africa!

While strolling about with Mr. Hooper we saw one or two hippopotami in the lake, which he said swarmed with crocodiles. They were very bold and savage brutes; one of them had recently seized and badly mauled a native boy who was lying asleep in the verandah of a hut, and though happily rescued before the crocodile dragged him into the lake, the poor lad died from the terrible wounds received. Mr. Hooper told me that the wages paid to the Wa-Giryama by the Mission were ten pice per man, and that they only got an hour's rest a day. I spent a very pleasant evening and then came back to my camp, which was fairly comfortable under the trees; my people were camped around me in three batches: nearest me were the Wanika, then came the askaris, who, being more luxurious, had built themselves a hut; the rest were perfectly happy sitting round their different camp-fires and sleeping in the open. They all made an awful row singing, talking, etc., but one got accustomed to it. The country round my camp appeared to be a flat plain, covered with dry grass and clumps of bush, and some trees. The soil varied from a friable black to a lighter-coloured earth, but was all good.

At first Jelori lake does not seem as large as it really is; it is only after going round a portion of it, and coming upon bay after bay—each hidden by the intervening point of land until it reveals itself—that its actual size is realized. It lies in a basin, from which the ground rises gently on every side, and is surrounded almost entirely by thick bush, with a fringe of high grass near the water's edge, amongst which were numerous marks of hippos. I walked round a considerable portion of the lake, the bush being so thick that one had to crawl through on hands and knees. The water is very discoloured, of a deep yellow colour. There is one island in the lake, and to the north and east there are some low hills—including Sekoki—

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and many small villages. There were one or two small Giryama clearings near the Mission houses and settlements. Near the water's edge the soil was a stiff clay; higher up, a stiff tenacious black loam; while beyond the borders of the lake it became more friable. I discovered later on that in the wet season the northern end of the lake and the Sabaki are connected by a channel through which the river flows into the lake, and at the same time floods the low-lying land between it and Sekoki Hill, forming an extensive sheet of water 5 to 6 feet deep. The only means of communication between Jelori and Melindi is then by the Mission canoe. In the dry season this low-lying flat, with its rich, deep, loamy soil, is extensively cultivated by the Wa-Giryama.

Mr. Hooper informed me that the people had two cultivating seasons, one in the S.W. monsoon at the beginning of the year, and the second during the N.E. rains. In the afternoon of my second day at Jelori I went to return the visit of an important Giryama head-man who had been to see me. I struck off by a path leading to the Sabaki, passing two smaller lakes (alive with hippos), one on the right hand and the other on the left, and through gently undulating country with big trees and excellent black soil. I then came upon a third lake connected with the Sabaki by a deep natural channel. The banks of the Sabaki, which I followed for a short distance, were cultivated by the Wa-Giryama with patches of Indian corn, sweet potatoes, and tobacco, though the soil, a fine sandy loam, is evidently flooded in the wet season. The north bank was flat and low, and covered with deep white sand left by the last flood. Beyond this, as far as could be seen—up to Magarini Hill, which was distinctly visible to the N.E.—the country was very flat and entirely covered with bush. Water could easily be diverted by channels from the river into the plain beyond, and the extended development and cultivation of the latter secured by a proper system of irrigation. I was informed that there was a direct path known to the Wanika from Jelori to Magarini Hill, over which I subsequently travelled.

Our path now led through fine forest and by some large Giryama clearings. These people apparently clear only the undergrowth, killing the large trees by heaping up the dry

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brushwood and firing it; and the appearance of these clearings, with so many charred trees left standing, was most unsightly.

I now came upon a large flat area evidently flooded by the Sabaki in wet weather, with some very fine tobacco and Indian corn growing, and finally arrived at the Giryama village of *Kizomba*, one of the largest round Jelori. I held a "shauri" with the chief, Kizomba (a Giryama village generally takes its name from the head-man), and the principal people, telling them I had come into their country to see how its resources could be developed, that I was ready to give them seeds of new products, and wanted the head-men of the villages round Jelori to come to my camp, where I would have a shauri with them and explain everything. My remarks were well received.

I returned by the back of Kizomba village by another road, passing through fairly good forest, amongst which I noticed a good many cacti and Hyphæne palms; also a good many aloes (*Sansevieria* species) called "n'konge." The fibre of the latter is much used by the Wa-Giryama for making ropes and fastenings of all kinds. We passed a good many newly-burned clearings in the forest, which the Giryama were preparing for the coming N.E. rains. All this forest land had fine black soil. I arrived at my camp late in the afternoon, well pleased with the results of my expedition.

Next morning I went off with Selim in quest of hippo. Baba, the Melindi head-man, came with us, but he was of no use, as he lingered behind unwilling to follow us through the long grass, so we got a Giryama to show us the way. He led us over the flat, through thick high grass, and through deep black oozy mud to the edge of the lake.

As there was no shelter, Selim made a screen of sticks and grasses. I saw three hippos with their heads out of the water, one a very large one, and another with a young one on its back. When they perceived us they made an awful row, snorting and bellowing, but keeping well out of range; we sat waiting on the wet mud for nearly two hours, but to no purpose. On turning away, I saw three or four large crocodiles sunning themselves a little way off; I stalked one

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on my hands and knees, and then fired, but only hit him in the side, and he rushed back into the lake.

After having tea with the Hoopers, I went down to the lake again, and saw three hippos; I fired two long shots at one, but missed. It was now getting dark, and just as I was turning away a young female hippo came straight for us, and I got a splendid shot at her right between the eyes with my Martini-Henry. Next morning there was great rejoicing among the Wanika and Giryama over the dead hippo. They are very fond of its flesh, and had dragged it ashore. Mr. Hooper had the body towed by his canoe to the point below his house, and superintended the cutting up of the meat for the people—who took everything away, even the entrails. Mr. Hooper promised to bury the head and keep the skull for me until I sent for it.

I was desirous to examine the Sabaki end of the connection between the river and the lake, so I made a second visit to the place, crossing the intervening flat, which lies to the north; the soil is in most places a tenacious grey to black clay, but very rich. After the floods this flat land is cultivated by the Wa-Giryama, and I saw large patches of Indian corn, beans, sweet potatoes, and tobacco, and passed a good many newly-burned clearings, ready for the N.E. rains of October and November. The grass was fully 7 feet high.

Next day I set off with my two head-men, and Ramazan as interpreter, to visit two other Giryama villages some distance off. Passing through fine open flat country, glades and scattered bush, with a fine friable light soil, I came upon a small Giryama village, and spoke to the head-man, as I had done in the previous case, and he accompanied us to the other and larger village further on. On our way I caught a distant view of the Sabaki and the country near it, covered with heavy forest. The soil here became more red-coloured and porous, and the drainage of the surface soil appeared remarkably good; the forest becoming thicker as we proceeded, and the country more broken and hilly. On the way I noticed a small field of specially fine tobacco; it was luxuriant in the extreme, and the country about here seemed

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A GIRYAMA VILLAGE.

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to me particularly well adapted for the cultivation of this crop. The soil was excellent, a fine friable black mould.

The Giryama village I had specially come to visit was right in the forest, and the largest I had yet seen. The head-man, by name Toyo Wabakulo, appeared most intelligent. On mentioning my idea of making a small experimental plantation at Jelori, where the people could come and see the new products cultivated and obtain seeds, etc., he was much interested in my scheme and offered to look out and find a suitable piece of land for the purpose. This head-man accompanied me back to the camp, and in the afternoon (September 23) I held an important "shauri" with eight of the principal Wa-Giryama head-men of Jelori, including Toyo Wabakulo and Kizomba.

I entered fully into the nature of my mission in the country, and said that now I had seen and examined it, I felt sure that many new products could be grown. I added that I was going to suggest to the Company the establishment of an experimental plantation here, where cultivation of new products would be introduced, and where they could come and see and learn for themselves; that seeds would be supplied to them (instancing tobacco), and that eventually the leaf of the new variety would be bought from them. I asked them whether if this was done they could supply the labour required. They replied most eagerly that they would, and wanted to hear when I would begin—in fact, they all appeared to be most interested in the matter, and said they would most gladly cultivate any new products, provided a sale of the same was assured them. I promised that this would be done, asserting that the Company was most desirous to see their country developed and their people prosperous and happy. I then distributed some good tobacco-seed among them, telling them to grow it quite apart from their own. The Wa-Giryama around Jelori alone number over three thousand; they are intelligent, industrious, and keen agriculturists; their blacksmith's work too is remarkably good. They make their own hoes, and I was shown some necklets of iron of remarkably good manufacture.

I see no reason why this tribe should not be induced to



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take up the cultivation of many new products; indeed, they appear most ready and willing to do so. Besides growing and curing tobacco, they might also cultivate cotton, jute, rice, indiarubber, and the castor-oil plant, in the fine forest land along both banks of the river.

It seems to me that this would be a much more effectual mode of opening up the Sabaki country than that of merely inducing freed slaves from the coast to come and settle here.

Land, I feel sure, would soon be taken up around Jelori; Mr. Hooper, to whom I mentioned my views, expressed his entire concurrence. An important point, too, would be the proximity of the Church Missionary Society's station; the educated and Christianized natives would be most useful on the model plantation, where they would find employment, and form an important factor in helping to civilize the district. Mr. Hooper very kindly consented to take charge of a rain-gauge, and to keep a record of the rain-fall at Jelori for me, and I take this opportunity to gratefully acknowledge how much I was indebted to Mr. and Mrs. Hooper in a number of ways, for many acts of kindness and sympathy during my stay at Jelori. Mrs. Hooper, I grieve to say, died soon afterwards of fever.

This evening I availed myself of Mr. Hooper's canoe to go out on the lake after hippo; it was the first time such a thing had been attempted, and we had an exciting time. Mr. Hooper, myself, and Selim, with two men to punt, went straight for five hippos in the water. One came right for us, and to make certain of my shot, I waited for him to come nearer still, but to my disappointment he suddenly veered off into deeper water. Selim now proposed that we should bear down on a group of about a dozen hippos, that were watching us, and when quite near to give them a fusillade; but unfortunately we could not get near them, as they kept moving away as we advanced. Moreover it was getting very dark, and we had some very narrow escapes from being upset, which, with the probability any moment of a hippo coming for us, made it very lively. One of the askaris was in an awful funk, and I could not much blame him; for if we had been upset the consequences would have been much more serious than a

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ducking—nothing, in fact, could have saved us, for the lake simply swarmed with crocodiles, and we saw one or two monsters swimming about, and keeping near us. Mr. Hooper assured me it was not safe for a child to go down to the water's edge, as the crocodiles would seize them at once; even donkeys and other animals going down to drink often became the prey of these brutes.

I found the hippo pie at dinner that evening not at all bad; it tasted rather like beef. Mr. Hooper told me that the *Wasania* (a Tana tribe, about whom I shall have more to say further on) are great hunters and eaters of hippo flesh, and that they have a regular sort of *call*, which only a few of their hunters are able to make, that so irritates the hippos, that it brings them snorting out of the water, when the hunters shoot them with their poisoned arrows. Another method of tempting them ashore is to wave a white cloth on a pole, which apparently has the same effect upon them as a red rag on a bull.

There was a good deal of rain during the night, and my people had rather an unpleasant time of it. As many as could do so crept under the fly of my tent!

The Wa-Giryama are undoubtedly the most important and numerous of all the tribes along the coast-belt.[1]

*Giryama* (their habitat) "is the name of a tract of country in East Equatorial Africa about fifty-five miles in length, and about thirty-five or forty miles in extreme breadth, of which the northern extremity may now be said to touch the Sabaki river at Jelori, while the most eastern point is at Nyari, on the inner slope of the range of hills that runs S.S.E. from Mount Mangea to the port of M'Tanganyiko, and the most southern is at Kaya-Giryama (metropolis of Giryama), some hours north-west from the C. M. S. station of Kisulutini. The most westerly portion of Giryama seems to be the districts near Kira and Wacho.

"The country falls into three divisions: the Weruni (or

[1] For the following notes I am indebted to the Rev. W. E. Taylor's cordial kindness in giving me permission to freely use the valuable information contained in his *Vocabulary of the Giryama Language*, published by the S. P. C. K.

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'Veldt') of Giryama, Central Giryama, and Northern Giryama—of which the latter is perhaps the most populous.

"1. *The Weruni*—once thickly populated, as is evidenced by the numerous deserted palm-groves and sites—is comparatively well watered, abounding in springs. Its soil is reputed to be fertile, and to afford excellent pasturage; but the incursions of the Masai have driven away the inhabitants from the more exposed portions—those between the Kaya and the

WA-GIRYAMA.

south of Mwaeba's Hill, where is the C. M. S. station of Kam'likeni ('Come-and-praise-Him!')."

The Weruni is composed of twelve districts, or "malalo."

"The first five of these are said to number only a single town apiece (1887), not reckoning the settlements of Kambas. The rest are fairly populous, with the exception of Gotani. The last seven lie in a line between the Kaya and Mwaeba's.

"2. *Central Giryama* is arid, with salt rivulets and springs. The surface water is used for drinking, and is collected in

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'mitsara,' or holes made for the purpose. As in the dry season the supply is exceedingly scarce, it is preserved by means of spells and 'medicine,' removable only by the possessor, in whose absence no water can be drawn from the pits without incurring the consequences of violating the spell. Many families who were originally emigrants from the Weruni are found in this part of Giryama, but the great bulk seem to have settled in the northern division.

"Central Giryama is composed of thirteen districts.

"3. *Northern Giryama.*—Mount Mangea, at the extreme north-east of this division, is said to have been the original seat, not only of the Giryamas, but of the different Taita tribes. This statement is remarkable, for the languages as at present spoken present a great contrast, the Giryama approaching the Nyika dialects, and the Taita approximating to Kamba in structure and sound. At present Mangea is almost waterless, and the villages at its base have to fetch their supply from a great distance for many months together, in some cases from brackish wells more than two hours distant. The night is often devoted to the procuring of the daily water supply. The heavy dews explain the luxuriance of the crops in this otherwise droughty northern district.

"The principal districts included in Northern Giryama are—

"*Kaziya-M'oyo.*

"*M'kauma-K'endzi* ('the Kauma-man doesn't like,' so called from a contention which arose between people that had left the Weruni to find a safer abode in North Giryama and some Nyikas of the Ribe tribe, who had separated from their fellow-tribesmen by reason of a severe famine, with the intention of making a temporary sojourn in the hilly district they now occupy. Here the fertility of the spot was such that they said *Hudzire hukauma*—'We have come and we remain'—hence their name. They multiplied at such a rate that they pushed northwards into the Giryama territory vacated by the Gallas, and claimed this particular district as theirs when the Giryamas came 'to take their own again').

"*M'tsangamale.*

"*Magogoni* (stumbling-blocks, or, logs-in-the-path).

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"*Rare kwa Mwavuwo* (Mwavuwo's at Rare), a Digo settlement.

"*Dindiri kwa Ngonyo* (Ngonyo's at Dindiri), another Digo settlement, under the father (?) of the preceding chief.

"*Sinikumbe* ('Touch me not,' said to the encroaching Kaumas by the Giryama settlers).

"*Mangea*, on the western slopes of the range of that name.

"*Mangea-wa-Nyasi*, Grassy Mangea, the plain to the west of the mountain.

"*Fuladoyo* (from the Galla, 'fuldoya' = looking-glass).

"*Migodomani* (the Mgodoma trees).

WA-DIGO.

"*Mwangudo* (on the river of that name).

"Many of the 'malalo' are now depopulated. One of the most populous is that of *Magogoni*, in Northern Giryama.

"In both Central and Northern Giryama, people in favourable years reap large harvests. Fruit-bearing trees are comparatively scarce in this region; the papaw and pineapple are, however, plentiful, especially the latter. Coco-nuts, mangoes, oranges, and bananas are said not to do well, and limes, and especially lemons, are poor.

"The numerous wild aloes, screw pines and bowstring hemps (*Sansevierias*), Euphorbias, the dried boughs of which are used

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for torches, and Cycads, are here and there burnt down annually by the people engaged in making clearings for cultivation; hence the ground becomes covered with an alkaline ash, from which the salts are washed out by the rains and carried into the soil. To this may be due the nauseous character of the spring water in parts of the country.

"The destruction of the forests may have affected the rainfall, for since the last colonies were led into Central and Northern Giryama (upon the withdrawal of the Gallas, about a century ago), the old people say that there has been a great change, not only in the character of the water (which used to flow *sweet* in the Muhoni river and that near Fuladoyo—the *muho wa Mwa-Ngudo*—'the river of (the hill of) Mwa-Ngudo'—as well as in the river Bale), but also in the fertility of the ground; in many places it will no longer grow the banana to perfection as formerly on account of the 'bitterness of the soil.'"

The Giryama people (in Swahili, Giriyama or Giriama) inhabit the country north of Mombasa between 39° East longitude and 3° South latitude, and form the most important of the tribes inhabiting the immediate coast-zone. They are quite separate from the Nyika tribes, which both they and the Digos affect to despise.

The Nyika tribes inhabit the country north and south of the Giryamas.

"NOTES ON THE GIRYAMA RELIGION.—*God*, Mulungu, is often popularly understood as (1) Sky, (2) luck, (3) manes of father, etc. The Preserver, *Murindzi;* the Disposer, *A-henda-ye-to;* the Creator, *Muumbi.* In the Giryama natural philosophy all things are supposed to have been created by the union, as if in marriage, of the Sky and the Earth; both are supposed by some to be living beings. Hence, probably, the native scruple about selling a piece of land; it is the trees only that are considered as being salable.

"Giryamas believe that two persons, a male and female, come from above to every child's birth; if a boy, the male assigns to him the period and manner of ending of his life; if a girl, it is the female.

"We are supposed to be God's hens and chickens; and if a

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person dies, it is thought that a stranger has arrived in heaven, and a fowl has been called for his entertainment.

"It is not thought that spirits are created afresh; all spirits are the same. When a person dies his spirit is put into another body, and yet the *k'oma* is 'culted': for the Giryama thinks that the disembodied spirit is powerful for good and evil. Individuals worship the Shades of their immediate ancestors or elder relatives; and the *k'omas* of the whole nation are worshipped on public occasions.

"A jinn or demon (*pepo*), called Katsumbakazi, is said to be seen occasionally. It is malignant, and, being of no great stature, when it meets any one, is jealous lest it should be despised for its insignificant size. It accordingly asks, 'Where did you first catch sight of me?' If the person is so unlucky as to answer, 'Just here!' he is sure to die shortly; if he is aware of the danger, and says, 'Oh, over yonder!' he will be left unharmed, and it may be that some good will happen to him. But a jinn is not human.

"The European 'ghost' is not known, but the spirits of near ancestors may appear in dreams, and give directions to their acquaintance and relatives. Sacrifices at the deceased's grave for the sake of satisfying the hunger of his spirit are frequently made in consequence of such directions.

"Sacrifices are made at their graves to such of the departed as have families. A little flour-and-water is poured into a sort of funnel of cocoa-nut shell let into the ground (*m'sala*), and all fowls, etc., are killed so that the blood falls on the grave, and a portion of all food is reserved for this purpose. On making the offering, the dead are called by name to come and partake, and told to bring their friends, who are also mentioned by name. An upright post or wooden 'headstone' is placed at the head of the graves, carved for the men, plain and small for women. It has a sort of neck. The men's have a piece of old *kitsambi* (coloured cloth) and *bendera* (Turkey twill) wrapped round them; the women's have the national kilt in miniature. The irreligious and careless among the Giryamas are reminded by their friends about the duty of sacrificing, and people that have been growing negligent remember these duties of their own accord, *e.g.*

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when ill, when about to take a journey, at a wedding-feast, or a child-birth; the latter, in order that *Mulungu amulaye*, that 'God may forget' the child, that it may live (!). *Mulungu ni amulaye bai apate kukala muzima!* 'Well, God forget him, that he may become strong and well!' says one, on hearing of the birth of a friend's child. At the burial of chiefs a bullock is offered, and every relation who comes to the *hangani* (rites) will make his offering. A man and his wife, though buried apart, have their memorials (sticks or head-posts) placed side by side.

"At the sowing of seed after rain, a little of the seed is ground and poured out early at the door of the house of the person that will sow it, with a simple prayer to the departed spirit (*koma*). At harvest the same is done at the door and the garner. Also when *pombe* (beer) is brewed, some of the liquid is poured out at the gate of the town, at the roots of the chief trees, and on the graves within its walls, and a prayer accompanies the act: 'That he may proceed to drink, and when he is intoxicated let him sleep, and not revile his companion, nor engage in quarrelling, so that when he rises up from here he may rise up with the fumes out of him; let him sleep.' (*Ende-nwa pombe, akirea ni alale, atsahukana mwandziwe makaheha; hata akinka haha auke udzam'leuka; ni alale*); that the drink may not excite quarrels. Upon erecting a forge, a solemn incense offering is made in secret on the anvil-block.

"*Prayers* (ku-hasa koma) are offered to the manes at the building of a town, before war expeditions, and when persons are sick. When the town is removed the grave is not dug up, but a cenotaph is erected with prayers and sacrifices, a tree having been cut down early in the morning to serve for the head-post.

"No distinction is made between spirits good and bad; but a spirit is thought to be as much subject to changes of temper as a human being. *Komo ya nganya Kaifwaha Kamar, idzagomya vit'u na nganya K'aholere* ('The Shade of So-and-So's father is of no use at all; it has finished up his property, and yet So-and-So is not better'), said one Giryama to another about the result of a series of offerings a man had

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made to his paternal Shade with the object of regaining health.

"Means used for looking into the future—

"*Divination* (kutsuha mburuga), and *casting lots* (kuhenda milamulo), are both greatly in vogue. The former brings great profit to a class of medicine-men, *aganga*, who inspect the results of the casting of a number of heterogeneous articles out of a magic dice-box into a circle drawn in the dust.

"The latter method may be resorted to by any individual interested, without any previous ceremonies. He takes two sticks and a castor-oil seed (*M'Bono*), and places them together the night before an intended journey, about the advisability of which he is uncertain. If on the morrow the articles are found to have come together, the omen is considered favourable.

"*Rain-making* (kwenda lomba wula). Water is poured into the jar in the *kiza* or shrine of the *koma* (Shades).

"The Shades are invoked at the rite of circumcision, etc. The ceremonies are not different from the ordinary Kuhasa or cult.

"*The hyæna* (fisi). This 'token' is still held in veneration. When the sacred animal dies, the whole tribe shave and make other signs of mourning. The sacred howling of the *Muandza* drum is in some way connected with the *fisi*. The innermost circle of the curious Freemasonry, presently referred to, derives its name from this beast.

"MAN'S EARLY STATE.—*The havoc wrought by the woman.*—The Giryamas say that 'in early times people never did any work, but had it done for them by animals. And it was the woman that did the harm by wanting the head of an animal. An animal was wont to be caught in the garden, where they were having the cultivation done for them by the animals. The animals used to come to the village without having any heads. And so the woman said, "These animals that come every day never have heads! But where do the heads go?" But the husband said, "Eat the flesh: what need have you of the heads?" And so she ate it. And at last one day, as the husband was going to the garden, she followed behind him, and went on till, when she arrived within

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the garden, she stood still at the trunk of a baobab tree in order to see those animals with no heads. At length these coming along began to set about their tasks. And she said, "La! to be sure, those then are the things that cultivate—those creatures!" And she said, "Well, I have seen them!" At last, as she was wanting to go back to the village, one animal saw her, and said to his companions, "Look behind the baobab tree!" And then, as they looked, they saw the woman, and immediately on seeing her they all threw down their hoes and ran away, and became some light-coloured apes, others some dark-coloured apes. Now, if it had not been for that woman we should still be having our cultivation done for us by animals. After this, as whenever those animals saw her husband, they would run off, he wondered: "What have they seen, these creatures that are running away?" So as he was looking about—"it is that wife of his!" And he went and said to her, "Now, then, what have you come wanting here?" But she could find no answer to give him. And he said, "You used to have your cultivation done for you. But you have been to look at the creatures, and so you shall cultivate yourself."'

"So (it was that) people began to cultivate from that very time up to the present.

"THE ORIGIN OF DEATH.[1]—The Chameleon was ordered by God, 'Go and tell people that they are to multiply, but not to die.' But while the chameleon, with his usual slow gait, was departing to go and give (his message), the Mugakha Lizard had also heard, but he went off at a run. At last when he had arrived where the people were, he said, 'You have been told to multiply, but die.' And he immediately departed. Then the Chameleon too appeared upon the scene and gave his message: 'You have been told to multiply, but not to die.' And those people said, 'Well, where were you? We have already been told by the Mugakha, and you too

[1] "The myth of the Chameleon, typifying the failure of the good principle in man before the evil, and its result in bringing death upon the world, is told with hardly a variation by the Zulus. See Bishop Callaway's *Zulu Collections*, published in South Africa, for a sight of which I am indebted to the Bishop of Salisbury."—Rev. W. E. Taylor.

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come to tell your falsehoods! If you had really been sent would you not have come before now? Well, we have the account of yonder one who came and told us first.' And the Chameleon was accounted a liar, while the Mugakha was (forsooth) a truth-teller, all because of his speed.

"The Giryamas believe in a *devil* or possessing spirit (*pepo, pepo nyama*). There are a number of the latter in the Giryama demonology—of whom many take their names from neighbouring African nations—amongst others being *Nyama vuma-titi* (the 'owl' that seizes little children in the night, *i.e.* the croup).

"*Circumcision-cycles* (marika). These play a very important part in the Giryama commonwealth. Every child born before a certain time that is not already circumcised has to be brought to one common place, where the ceremony is gone through. All the children of one cycle receive a common name and are bound by a common tie. They grow up free of the same private clubs, and from their number are chosen the three *enye-tsi*, when the time comes for such promotion. The cycles always bear the following names (which are taken by their respective members), and succeed one another in the following order—

"(1) *Wula-mbere*, 'First-rains.'
(2) *Wula-kahi*, 'Middle-rains.'
(3) *Wula-nyuma*, 'Latter-rains.'
(4) *Tungudza*, 'Tomatoes.'
(5) *Puku*, 'Large wild rats.'
(6) *Nguluwe*, 'Pigs.'
(7) *Vitambi*, now meaning 'coloured cloths.'
(8) *Vitsoka*, 'Hatchets.'
(9) *Abi-Kizi*, 'Kizi's father.'
(10) *Atsai*, 'Wizards.'
(11) *Mafira*, 'Puff-adders.'
(12) *Mitseka*, 'Mats.'
(13) *Nyoga*, 'Feathers.'

"Coming next to the curious custom of Freemasonry, prevalent amongst this tribe, the system of initiation is called *Kambi*, after its most numerous division. The preliminaries to the *Habasi* (First Degree) are—

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"(1) *Uholo*, Infancy. The *muholo*, child, is not yet sufficiently grown, or cannot yet afford the fees, to become a candidate. From the latter cause there are many grown-up 'infants' in Giryama.

"(2) *Umondo*, the Candidature. Negotiations have been entered into by the child's father for his initiation into the first grade, the *Habasi*.

"(3) *Ubora*, the having been declared free of the *First Degree* (Habasi), follows in due course, and the youth takes his place among the *Ahoho a Haba-si-ni*, children in the Habasi. He is now allowed to have his share in the division of the fees paid by the *Umondo* for their candidature, which consist of flesh, beer, etc.[1] He and his companions are called *Nyere*, and are still under the care of their hierophant, the *Muhagizi*, who completes this stage of his teaching by putting them through a course of medicine, teaching them simples and spells (but not charms or fetishes—*pengu*), in the woods, where he takes them and shows them every medicinal herb. While engaged in this study, the initiated receive the name of *Ahoho a Miha-so-ni*, Children in the Simples.

"*The Preliminaries to the full status of the K'ambi.*—There are four ceremonies of initiation to be passed before an M'Giryama can enjoy his full status as a citizen; each is named after its ceremonial dance.

"(1) *Gawe, the Distribution or Partition*—that is, into those who may and those who may not wear the full-sized loin-cloth. The mysteries last six ritual 'days' of twelve hours each, which are practically three ordinary days. The Giryama daytime is divided into ten *mirongo* or decades, which are,

[1] Their method of making beer is thus described—

"One begins by putting the grain into the mortars with water; and at daybreak you put (it) into leaves, and leave (it) until it has stayed two days, then you go to see it; if you find it has not yet shot out shoots, you then put water upon it again, and it again stays two days, until when you go, thus, it has shot forth shoots, it has become malt; then you take it out and spread it in the sun, and at last when it is dry and you grind it, it has become a seasoning, and then if it is to be for *tumbu* (a kind of pap-like beer), one puts it in (the pot), and if not, it is for beer."

An intoxicating drink is also made from the cocoa-nut, wild date, and Hyphæne palm, and called *uchi*-mead.

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however, only imaginary divisions. The hierophant of the *Gawe* is called *M'kuzi*, as if to say, the Initiator of the Greater Mysteries, and the Mysteries themselves are called *Mwandza M'kulu*, the Greater Mystic Drum. The candidates, *Ku-tsindza rigo*, 'flay the Great Skin' (?), *i.e.* they are shown the *Mwandza* by the Initiator. This drum, with its strange roaring bellow, is used to excite the superstitions of the common people.

"(2) *Sayo ra K'oma*, the Clapping of the Shades (the ancestral ghosts), is a dance which lasts only one day. The hierophant is called simply *Mwenye Sayo*, the Clapping Man. There seems to be no special names for these officers in the succeeding steps.

"(3) *M'ng'aro*, Shining, is the same in the duration of its ceremonies as the *Gawe*. It receives its name from the fact that the candidates are entirely smeared with clay, which gives them a weird appearance.

"(4) *Kirao* lasts for the same period as the *Gawe* and *M'ng'aro*. In this dance the bodies of the initiated are reeking with oil. They vie with one another in the amount of their fees, and the one who surpasses his companions is entrusted with the keeping of the ritual drum peculiar to this class—a long bamboo closed at the end with a tight skin, and beaten rhythmically with a pounding motion upon the ground. This drum they call their *musichana*, or 'young woman.'

"The man has now become free of the *Second Degree*, the *K'ambi*. He may assume the *luwoo* or armlet, denoting status, at the *Nyambura* dance, and sit in the *M'oro*, or Parliament, where at first he is usually content to listen to his elders, and learn the tricks of rhetoric. His ambition now is to become a member of the *Azhere*, Elders. These are—

"(1) *Waya*, or Circle of the Elders. These may deliberate on smaller judicial questions in their own district (*lalo*), but are really nothing more than a convivial club. They are privileged during their sitting with inviolability of person, and then may confiscate any goat, fowl, ox that comes in their way, or any beer or food of any description, if so minded. They carry such articles off to their *bandari*—the *Waya* club-house of their district. They even confine persons who intrude upon them

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until the offenders can ransom themselves; and no one who is introduced to them is allowed to salute them, nor do they salute one another in the ordinary manner. In the woods their drunken howlings often make night and day hideous, and altogether the people are becoming tired of them, as they grow less useful to the State.

"(2) The *Fisi*, 'Hyæna'—the Inner Circle of all, and very select. The chief of the *Azhere a Fisi-ni*, is the *M'kuzi* (see under *Gawe*, above). The members of the Hyæna inspire great terror, as they are the depositories of the most potent spells and oracles.

"The *Enye tsi-i*, possessors of the land, are the three elders that govern Giryama and judge the land. They are chosen in rotation from the last two classes, according to their succession in circumcision. These retain power during the interval between one circumcision and another. They can convene the *M'oro*, or general assembly of the *K'ambi*.

"The Giryama *month* is divided into three decades (*makumi*). There are seven 'weeks' of four days each in the month, always beginning with the first day of the week, *Jumwa* (from the Ar. *ijumaa*); the second day of the week is *Kuramuka* (= awakening?); the third, *Kurima-hiri* (= second cultivating); the fourth, *Kuisa* (= finish). Hence the month may be tabulated as follows—

"1st day, *Mwezi-mosi*, is *Jumwa ra mwezi-mosi*.
2nd „ *Mwezi-hiri*, is *Kuramuka*.
3rd „ *Mwezi-hahu*, is *Kurima-hiri*.
4th „ *Mwezi-nne*, is *Kuisa*.
5th „ *Mwezi-tsano*, is *Jumwa ra mwezi-tsano*, etc.

"After the first ten days, one begins again—*mwezi-mosi*, *mwezi-hiri*, etc., and so on to the twenty-first day, again—*mwezi-mosi*, *mwezi-hiri*, until the next new moon appears. If there is an odd day or two at the end of the month before the appearance of the new moon, they are kept as *Jumwas* (rest-days). When the new moon is sighted, the seer exclaims, *Ko - - -ngo!* (prolonging the first syllable), and all who are within hearing respond in the same way.

"*Mwaka* means year in Giryama, but, strictly speaking, *Mwaka* is the rains that accompany the breaking of the S.W.

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monsoon, in March or the beginning of April. This is the proper time for all sorts of cultivation, and to be prepared for by one or two months of hard work in the fields. If the *Mwaka*, or Former Rains, are plentiful, great is the rejoicing! The ingathering, called *Mwaka Musha* (New Year), takes place about four months after the planting. Then, in July or early in August, come the Lesser Rains, *mutsuwo;* a season of fickle showers, seldom sufficient, in Giryama at least, to

WA-GIRYAMA WOMEN.

warrant any one planting for it. About October comes the second season proper for cultivating, the *Vuri*, Latter Rains.

"The different *seasons* are characterized in the following proverbs—*Mwaka ni hmama, Vuri ni amisimo*—'The Mwaka is one's own mother, the Vuri is the mother of one's cousin.' Again: *Vuri ni kitima-ngilo*—The *Vuri* is a grasshopper (lit. hopper of hops, a species that makes long aimless leaps), on account of the partiality of the showers. The first month of

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the *Vuri* cultivation is called *Kutsano*, but there are no special names for the other months. The seasons for cultivation are called *mirongo*, but the year is not divided into thirty-six decades, as is the Persian solar year used by the Swahilis in their cultivation, and for purposes of reckoning, navigation, etc."

A Giryama possesses only one lawful wife, though often concubines; these are also accounted wives (*muche*), but a concubine's child is considerably looked down upon, and has no status, and is called a bastard.

As to succession, the paternal uncle inherits on the death of the father, not only all property, but the widow and children as well! Another curious custom is, "when a man has sneezed, for him immediately to name some of the members of his family, beginning with his father (*e.g.* 'I am a son of So-and-so and So-and-so!'), or any ancestor or relative whose name comes easily to the tongue. People present are wont to say politely, '*Chamba u mwana wa nganya laha!*'—'If thou'rt the son of such a one, swear (by his name)'! This custom is thought useful for keeping up genealogies."

In conclusion I quote in full the Rev. W. E. Taylor's comparison of the Giryama to the Swahili language.

### RELATION OF GIRYAMA TO SWAHILI.

"It will be an instructive study for the student of 'Bantu' tongues to compare these two languages. The Giryama is interesting to the philologist from its preserving, almost intact, much of the vocabulary and grammatical characteristics of the old language on which the modern Swahili is based —the Ngozi. Giryama and Swahili are seen from internal evidence, like many another pair of Bantu tongues, to have been once a single language that at some time or another became split into two ever-increasingly divergent dialects. Whatever difference of form these dialects now present is probably due to the history, so very different in surroundings and fate—of what was once a race of identical origin, manners, and language. As to the respective peoples, there could hardly be a huger contrast than that which they now present; the one, decimated, small, compact; essentially inland, non-



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slave-holding (there is no genuine Giryama word for 'slave,' although the institution itself exists in a mild form), and uncommercial; confined as to habitat; republican in institutions; conservative of manners, customs, and the Bantu religion (the worship of ancestors, and the belief in a God); destitute of literature, but handing down its legends with literal accuracy of expression and detail—it has apparently preserved its purity of language and lineage up to the present time. The other is, in these respects, what it might be expected to be from its character and accidents—a seafaring, barter-loving race of slave-holders and slave-traders, strewn in a thin line along a thousand miles of creeks and islands; inhabitants of a coast that has witnessed incessant political changes (including invasions and civil wars), and a succession of (often foreign) monarchical dynasties in various, usually multiple, centres; receiving into their midst for ages past a continuous stream of strange blood, consisting not only of serviles from the interior but of immigrants from Persia, Arabia, and Western India, men that have come to live, and often to die, as resident aliens, leaving in many cases a hybrid progeny;[1] while of the one section of these immigrants—the Arabs—the religion has become the master-religion of the land, overspreading, if not entirely supplanting, the old Bantu ancestorship, and profoundly affecting the whole of the family life; and at the same time, owing to that religion imposing the daily use in its numerous observances and ceremonies of a tongue 'not understanded of the people,' no less profoundly affecting the native vocabulary and idiom. This latter is perhaps the greatest of all the disturbing influences enumerated above; for example, we find that the original native expressions in such departments as Prayer, Blessing, Ejaculations, Salutations, etc., have either vanished or become obsolete, or are being gradually ousted, their places being occupied by the stereotyped Arabic expressions common to Islam. The language of the one people is a fund of native roots with a

[1] "And here we may mention the result of the successive Portuguese occupations, dating from 1500 to 1750; they have left their mark behind them in this respect also, for some of the 'tribes' of Mombasa lay claim Portuguese descent."

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living and elastic apparatus of prefixes, etc., by the intelligent use of which new ideas can be expressed in native forms without the introduction of new words from outside sources. The language of the other is a tongue originally constructed out of similar material and upon identical principles; but, so to speak, some of its joints have become stiff for want of use; parts of its body have mortified and dropped off, their places taken by artificial limbs; and its life-blood is in danger of being poisoned by the bad air of its surroundings."[1]

[1] For further information, see Appendix A.

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## CHAPTER VI

### THE SOUTH SIDE OF THE SABAKI RIVER

Leave for Merikano—Useless Head-men—Difficult Marching—A Land of Swamps—"M'Lengo-Baya"—First Sight of Wa-Galla—The Watoro—Camps in the Forest—Hyphæne Palm Toddy—Watoro Cultivation—Makongeni Stockade—The Runaway-slave Settlements—Reception by the Watoro—Trouble with my Askaris and Wanika—Cowardice of Old Jubah—Exploration up the River—Lost in the Bush—A Proud Cook—"Roughing it"—Back to Makongeni.

I LEFT Jelori on September 24 for Makongeni, making Merikano, about four hours distant, my first destination. As a rule I followed Mr. Anstruther's road, but it was under water in parts, and I had to deviate frequently into by-paths. Two askaris went on in front with Jubah, and the other three brought up the rear.

I was very pleased with all my people, and particularly with the nine Wanika, who were behaving splendidly. They had never given me any trouble (except on the one occasion when a difficulty was made about carrying water), and now that they knew they were on what for them was an exceedingly long journey, they did not appear to mind it in the least, and indeed seemed to be getting quite attached to me. Jubah bin Fukir and Baba, the head-men from Melindi, were not of much use; Selim's opinion of them was that they were only good at eating! Jubah lost the road the first day, and if we had not picked up a Wasania guide I hardly know where we should have gone to. However, I did not regret the error, as it enabled me to see a good deal more of the country; but my porters grumbled at having so often to turn back. Once we



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followed a hippo track, crawling through thorny bush on our hands and knees, and handing the loads on from one to another.

We first traversed fine open bush country, with a black cotton soil; then proceeded through heavier forest with light friable soil. I noticed that many of the trees had a good deal of light green moss hanging in festoons from the branches; and we passed a good deal of cacti. The way then led through some open glades with guinea-grass growing plentifully. After descending suddenly to a lower level, where we came upon a small lake in a hollow, with fine black cotton soil round it, we again missed the road and had to re-ascend and return, descending this time upon a large low-lying plain, with a good many Giryama clearings in the forest, planted as usual with Indian corn, pumpkins, beans, and tobacco, the soil being a rich tenacious black loam. Next we went through a dried swamp now covered all over with luxuriant guinea-grass, and a succulent aquatic species very similar in appearance to Mauritius grass. A great portion of this low-lying plain appeared to be under water during a part of the year. We shortly came upon a second swamp of black, oozy mud, with numerous hippo marks, and then another Giryama clearing in thick forest. This thick forest continued, with small knolls and hollows, until we emerged upon another small lake with bush, low and forest-covered hills in the distance. This lake was a mere shallow swamp, covered all over with excellent short green grass, upon which hippos appeared to feed largely, judging from their numerous marks. More forest and clearings followed, the soil being of a fine friable chocolate description, then a fine flat valley planted with castor-oil and Indian corn. Beyond this was a large, low-lying grass plain, with another swamp in the centre; we crossed this by a primitive native bridge, from which I inferred that the water was permanent. On the other side of the low hill we joined Mr. Anstruther's road again. Continuing through open forest land, with light-coloured sandy soil, we came upon yet another swamp, where we camped in some old huts, the remains of the former run-away-slave settlement of Merikano, at 12.30 p.m., five hours'

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march from Jelori. The water in the swamp was as black as ink, but thirsty men are not difficult to please, so we drank it willingly. The tea made from it looked like black paint!

We remained here for the rest of the day, and with water (such as it was) close by, and my tent under a large tree, it was pleasant enough. The forest at night was intensely quiet—there appeared to be no game about, and no night birds. There was a very heavy dew at night. Next morning I continued along Mr. Anstruther's road, through open forest land, and still noticed a considerable amount of light green moss hanging from the branches of the trees. Guinea-grass was very plentiful along the road. The soil along here varied from black clay to friable black or red loam. Gradually the forest became more open, and we emerged upon a large flat plain at a higher level than the surrounding country, which I could survey for a considerable distance. It consisted of bush and forest as far as the eye could see: this was looking north-west over the Sabaki. On the eastern side rose a solitary low hill.

This plain had a sandy, red soil, which was covered with grass and scattered clumps of stunted-looking trees, also with small bushes bearing a yellow berry resembling a very minute orange, but poisonous. We descended by a steep zigzag path. Once in the forest the soil was again a fine black loam. I thought it would be well worth while to keep Anstruther's road cleared by a small annual payment to the different tribes through whose land it passed. It had been cut at so much expense that it was a pity to let it revert to forest, since it afforded very convenient access to Makongeni. Its only drawback was that some parts of it were under water in the wet season.

Immediately at the foot of the descent we came upon another swamp which I had observed from above, quite surrounded by forest. It evidently floods the road in wet weather, rendering this part impassable; there is, however, another path which is then used by the people. This flooded portion of the road is called M'Lengo-Baya, meaning literally, "bad way."

Here I first saw some Gallas gathering the edible fruit or

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seeds of a water-lily which grew extensively in all the lakes I had passed. The other side of the lake consisted of small open bush and scrub, amongst which I noticed a good deal of cacti and aloes. Jubah had once more lost the way!

We afterwards came upon M'Lengo-Baya, at a distance of two and a half hours from Merikano, and rested there for about half-an-hour. M'Lengo-Baya was a cluster of huts inhabited by a community of Watoro, *i.e.* runaway slaves from the coast who were settled here, and also at another village further away, which I visited later on. Beyond M'Lengo-Baya the country was of a very flat and open character for some distance, with the same black cotton soil. The way now led through a belt of forest with a good deal of cacti, and further on came out upon a very extensive half-dried swamp, covered almost entirely with succulent short grass, and a species like Mauritius grass. This lake Jubah made us cross twice, and as the water in the centre was fully 3 feet deep and the mud black and oozy, I had to take off my boots and socks each time to wade across. We met more Galla people here, gathering water-lily seeds, and one of the Wasania, who bolted, leaving his drum behind him.

I may remark here (the matter being, as I shall eventually show, an important one), that I paid especial attention to these numerous lakes and swamps, and besides the personal observations which my subsequent and frequent journeyings to and fro enabled me to make, I ascertained that these marshes and lakes along the Sabaki have water in them on an average nine months in the year; this year they had been constantly flooded, the rain-fall having been much beyond the average. These remarks also apply to the northern bank.

The country surrounding this lake had a black cotton soil, and was covered with scrubby bush and grass; then we passed through forest with a good deal of cacti and aloes, the country being very flat, and the soil changing to a friable red. Then came open bush with clayey white soil, another small swamp covered with grass, more heavy forest, and eventually the Sabaki—the first time the main road approached the river since leaving Jelori. The banks were here very low, and looking across to the opposite side—the north bank—

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the country, as far as could be seen, was all flat forest land. I wanted to cross over, but Baba informed me it was not safe, owing to the crocodiles in the river. We camped at noon, the weather having been very hot all day.

There was a heavy shower at night, and next morning was cloudy and drizzling, the rain becoming heavier later on. The Wanika were grumbling a good deal, having got soaked during the night. We struck camp at 7.30 a.m., and entered a very heavy forest—the heaviest I had yet gone through—with large trees and dense, luxuriant undergrowth. This forest extended on both sides of the Sabaki, which the road now followed continuously to Makongeni. The Sabaki is here a fairly large stream with low banks, flowing through a flat country.

About five miles below Makongeni I noticed several groups of Hyphæne palms, from which the runaway slaves obtain their toddy, generally cutting off the heads of the numerous tapering branches. I also observed a good many aloes growing along the banks. The soil in the forest was most excellent, a fine black to fine chocolate loam. The country was very flat, and here and there glimpses were caught through openings of the Sabaki, which was now becoming a fine wide river with a steady full current. The opposite bank was very low and covered with forest. Numerous groups of Hyphæne palms were passed, and we saw some of the Watoro drawing toddy from the trees.

We now came upon a bend of the river, with very high crumbling banks fully 20 feet above the present water level; the flat river-bed was here composed of curious stone slabs, in formation very like large artificial paving-stones in red sandstone and slaty rock. Some of these, loosened by the action of the water, looked as if they had been artificially cut.

I noticed some very fine tamarind trees, and now came upon the first signs of Watoro cultivation, consisting of bananas, beans, dry rice, and tobacco, growing in flat rich country which was cleared forest land, the soil being black and chocolate loam. Judging by old flood-marks, the Sabaki must rise fully 8 to 10 feet in the wet season. Continuing, I passed through a good deal of runaway-slave cultivation

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which appeared to consist of the usual coast products. After traversing several abandoned clearings and heavy forest with some tamarind trees and a good many aloes, on turning a corner I came upon the stockade of Makongeni, the first of a series constructed in the beginning of 1890 by Captain Lugard up the Sabaki and on into the Ukamba country as far as *Dagoreti*, 350 miles from the coast. It was protected partly by a stone wall and partly by a palisade, and situated fully 30 feet above the level of the river.

The runaway-slave settlements were scattered about the country on both sides of the Sabaki, which was very broad here, but also very shallow, and easily crossed, the depth of water in the dry season being about 3 to 3½ feet. The Watoro, or runaway slaves, are fugitives from their owners at the coast; they have settled in these parts, and associated themselves together for protection up the Sabaki. As I have stated, their first settlement was Jelori, from which the efforts of their Arab owners to recapture them forced them to retire to Merikano, and eventually to their present settlements. Here they had been successful in resisting every attempt at recapture by their former masters. They were practically free men, residing beyond the ten-mile zone of Zanzibar territory, only within which the law of slavery had force; but they suffered from the disability of being shut off from access to the coast markets for the sale of their surplus produce, and of being debarred from obtaining employment, as their appearance on the coast would render them liable to recapture. Captain Lugard initiated a scheme, to which the Arab masters under certain conditions agreed, enabling the runaways to work out their redemption for a very small sum of money, and to resort to the coast unmolested for this purpose, but only a comparatively small number had hitherto availed themselves of the privilege—either considering themselves sufficiently free as they were, or not caring enough for the abstract dignity of freedom to take extra trouble to obtain it. The country round their settlement looked most luxuriant, as the forest had been cleared and planted by them (the Watoro).

We were received with a salute of guns by the four askaris

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stationed here by the Company, and having duly responded, some of the slaves came out to meet me, shaking and kissing my hand. Having sent for the head-men I pitched my camp some little distance from the stockade near the river, where the bank was 20 feet high, and I had a fine view down the Sabaki, both sides of which, further away, were covered with heavy jungle. Food was plentiful and cheap, there being rice, bananas, and plantains in abundance; Indian corn at three pice a kibaba, and beans at two pice a kibaba, could be obtained in any quantity, and formed the principal food of the Watoro.

Four of the principal slave head-men, accompanied by a good many armed followers, arrived after breakfast and gave me a regular fusillade of welcome, which my people returned. I instructed Jubah bin Fukir to inform the runaways that I had come to open up the Sabaki river district, and especially to visit them. I first spoke about Suliman's slaves, of whom I believed there were a good number here, offering to take back those who chose to return, and telling them of the Company's intention to give them their freedom if they would return to the plantations, where they would work as free men and be paid for their labour.

They all listened with great attention, and the principal head-man—by name M'Soma—replied that he would tell the slaves what I had said, but at present they were scattered all over the place.

I next touched upon the more important object of my visit. I informed them of my intention, subject to the approval of the Company, to establish an experimental plantation at Jelori, with a view to gradually opening up the district for better cultivation, and that I proposed growing different new products there in order to introduce them by degrees amongst them. I pointed out that there would be work available, for regularly-paid daily wages; and I put it to the head-men whether it would not be better for them to come down to Jelori, within reach of markets and civilization, and where land could be cultivated peacefully and money earned, than to continue living their present vagabond life away in the bush. The head-men replied that the same words had

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been spoken to them when Mr. Bell-Smith and the Liwali of Melindi were there, but that they feared the Arabs—that they had first settled at Jelori, and then the Arabs drove them to Merikano, and thence to this place—but that now the Company had come and would protect them, they were willing to come down to Jelori, and would abide by what I had told them. Lastly, the head-men said that they would call a conference of all the slaves next day, and let me know the result in the evening.

The head-men informed me that there was a good deal of sickness prevalent amongst them at present, three men having died the day before. It appeared to be a very sudden kind of fever and dysentery, and I gave M'Soma a supply of chlorodyne with careful instructions how to use it. I understood that there were fully 500 runaway slaves here, if not more.

It was very hot all day, with a cold wind at night, that made the Wanika crouch closely round my tent.

On the morning of September 27 I went off with the two head-men and Ramazan, and a M'Toro as guide, to visit the shambas and villages on the other side of the Sabaki. I was carried across the river below the stockade, where it was very wide and shallow, and flowed over a sandy bed. The soil near the river was a black loam; further inland it was very rich, generally a chocolate loam. The land was extensively cultivated by the Watoro, chiefly with Indian corn and beans, patches of rice, millet, and pumpkins, and some bananas. I visited two large and substantial villages, the inhabitants of which looked well-fed and contented, and everywhere the people welcomed me most cordially. I obtained a sample of tobacco from the head-man of the first village. It was sun-dried and rolled up in twist, and coiled round in a spiral strand like a rope; it looked coarse and strong, and was used for chewing. I ascertained on inquiry that the Watoro made no use of the "N'konge" aloes, of which there was a very great deal between Jelori and Makongeni.

I waded across the Sabaki on my return, and in the afternoon had a second shauri with the Watoro head-men. The

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same head-man, M'Soma, accompanied as before by a large number of armed slaves, came to acquaint me with the result of the discussion they had held that morning. They told me that they had talked over my words, and that whenever I wished them to come and settle at Jelori they would do so, but they now had crops, etc. to reap, otherwise they were ready to come at once. I told them I would communicate this reply to the Administrator, and that when I established a shamba at Jelori I would either come up to them myself or send them word. I had another conversation with them on the advantages of civilized life compared with their present fugitive condition, and they gave me the impression of being sincere in their promises.

I gave the head-man, M'Soma, a second supply of medicine (chlorodyne and cough medicine), and went shortly afterwards, accompanied by him and others, to visit the Watoro villages on the south side of the Sabaki. Proceeding through a large, flat, cultivated tract of country, with excellent soil, I noticed especially a back-water from the Sabaki running inland for a considerable distance, the water from which, it struck me, could easily be conducted over the adjoining land, and utilized for wet rice cultivation. I went into two villages, both large and well kept, there being thus four villages of runaway slaves, two on each side of the river. The population on this side, as furnished to me by their head-man, was two hundred men and four hundred women and children—six hundred in all; but the population fluctuated very much. Everywhere I was welcomed with the greatest cordiality, men and women in all the villages pressing forward to shake my hand—the women giving quite a particular grasp of their own. I had several shauris with the people, who were keenly interested in hearing of my mission to them and of the Company's great desire to see this district opened up. That the Watoro would be an important factor in such development there could be no doubt; they were splendid workers, as I afterwards proved. The Watoro expressed their utter ignorance of the country up the river, and on my inquiring the reason, the head-man said they were afraid of the Gallas, who, he declared, seized their people when they got the chance and sold them as slaves;

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they therefore did not venture to go beyond their own settlements, and when I asked for a couple of slaves to come with me to carry a supply of food for my porters, they said they were afraid. They told me that the country above here was all bush, and that Captain Lugard had marched along the banks of the river. They however knew the Giryama country well, and offered to furnish me with guides to it if required.

There were further difficulties awaiting me respecting my proposed journey up the river. On my return to camp, the four askaris refused to come further, and I sent them back to Melindi with letters to Mr. Anstruther reporting their conduct. Then my Wanika porters followed suit, begging me not to take them further; they argued that they did not know on leaving home that they were coming so far, saying that another time they would follow me anywhere. Well, the poor fellows had certainly done well so far, and they had come (for them) an exceedingly long way; so I told them to stop here while I went up the river for one day with the five Melindi porters. They said that they were quite willing to go to Takaungu with me.

I had reason to believe that old Jubah bin Fukir was to be thanked for all this. I was sure he had been frightening the people, for he was an arrant old coward, terrified for his life both of the Masai and the Gallas, and he had been a hindrance to me all through. The Melindi porters, at all events, were ready to go anywhere, and Selim and Ramazan were invaluable men, ready to go wherever I wanted and to turn their hands to anything.

I was thus able on this occasion, owing to the foregoing circumstances, to proceed only about fifteen miles above Makongeni, but I soon afterwards had opportunities of seeing more of the country, which will be described further on. My last night at Makongeni was an extremely cold one, so cold that my Wanika and other people outside were unable to sleep. In the morning there was a heavy white mist everywhere, and I could see my breath in vapour. It continued cold until the sun rose.

I started at 7 a.m. for my one day's trip up the river, taking only the two head-men, my servants, Selim and

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Ramazan, and the five Melindi porters, leaving my bed, table, etc., behind in order to travel as lightly as possible. We first passed through a large flat area of cultivated land, with an excellent and rich soil; I noticed some patches of tobacco, most luxuriant in appearance.

A M'Toro, who had come to show us the way, left us at the edge of the clearings, telling us there was only one path into the interior, and that we could not miss it. I was agreeably surprised to find a road of any sort, as I had half expected we should have to cut our way through the bush. The path we now followed (going we knew not where) was fairly good, and led us first through forest with excellent black loamy soil, then through open grass glades and dry scrubby bush. Beyond this we again entered heavy forest—the soil a rich chocolate loam—passing next through a great deal of very dense cactus jungle, beyond which were grass glades, surrounded by low hills covered with bush. We were now following the course of the Sabaki, here a fine placid stream with a sandy bed; the opposite bank was likewise covered with fine forest. The river winds a great deal, and on the several occasions when a view was obtained it was generally disappearing round a bend. The current was gentle, and in view of the very gradual rise nature of the adjacent lands from Jelori upward, it was apparent that the Sabaki's large volume of water could be utilized without the slightest difficulty for irrigation purposes. The views obtained up and down the river were very beautiful, and the calm winding stream peacefully flowing without a ripple, through dense vegetation, set off by the brilliant white sand of the river-banks, made a really charming landscape.

Further on, after passing through dense cactus growth, we came upon another large Watoro clearing upon the river, the soil of which was excellent. Some Hyphæne palms, all tapped for toddy, were growing here. I suspected that, notwithstanding their assertions of ignorance, the Makongeni people knew more of the country up the river than they pretended. We continued through open bush and euphorbia and open grass glades to a newly-made Giryama clearing, the heaped-up bush being piled ready for burning, and the

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edges of the clearing protected by a fence of cut cactus. I noted the fact of this new clearing particularly, as evidence that the north-east rains of October and November were depended upon for cultivation as well as the south-west monsoon in the early part of the year, and that the former were evidently sufficient for growing a second crop.

I obtained a guide from a small Wasania village which we passed, and went on through large open grass glades and a very dense cactus jungle, where I saw a good many aloes, and then emerged upon an open grass plain where there was another Giryama clearing, planted with Indian corn, castor-oil, and a little tobacco. The path here was quite lost—overgrown in the rich green grass, which, as the people said, "had killed the road." We passed through several low flat valleys, the soil being a very black stiff loam. These valleys are all flooded during the wet season, and when I returned here later on, on other duties, I found the country a sheet of water from 5 to 6 feet deep. The Wasania guide now left us, telling us there was only one road, but we managed to miss it further on, and followed what was probably a game track, continuing in a south-westerly direction and losing all sight of the river. This track led us through open bush and grassy valleys, each surrounded by rising ground covered with bush.

Beyond, there was open grass land, and in the centre a small lake with many water-lilies, and a good many water-fowl (wild ducks and geese). Here the soil was also a very black, stiff loam. The water in this lake was good, and the supply appeared to be constant. Passing through dense thorny scrub combined with aloes and cactus jungle which met above our heads, we found walking very difficult; here and there a path branched off, showing the country to be inhabited by Gallas, Giryamas, and Wasania—the last are a hunting tribe. Beyond this lay an extensive grass plain, very flat, the grass short and good but dry, and burnt in places by the Wasania. I saw a great number of buffalo tracks; these animals must abound here in the wet season.

The country now traversed was chiefly a large flat grass plain, with a few solitary trees, some scattered clumps of cactus

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and thorny bush, and in the distance low hills. The soil was chiefly black loam. Beyond was another jungle of dense thorny bush and cacti, traversed in every direction by tracks of large game. Progress here was terribly difficult, as we had to crawl through the cacti and bush, which extended for some distance. It was very hard on the porters, who were complaining of the heat and asking for water; so leaving them to await my return, I pushed on with Ramazan and Jubah to try and find the Sabaki again if possible. After toiling through thorny bush for some time we came upon open country, and as Jubah was lagging behind, we left him here to mark the inlet into the bush, and so guide us back to our halting-place; but when left alone he got frightened and went back to the porters. Ramazan and I went on a long way over a very barren plain, with short grass and scattered bush and trees; but there seemed no end to it, nor could we see any signs of the Sabaki. We therefore turned back to where we had left Jubah, but as he had deserted his post we could not find the entrance into the bush, but wandered about for a long time trying to discover and retrace our pathway. The situation began to get serious, so I fired off my gun, and had the satisfaction of hearing the shot replied to a long way off. This was a great relief to our growing anxiety, and we pushed back in the direction of the sound, and at last found the porters again. It was now two o'clock in the afternoon, exceedingly hot, and we had not a drop of water, after having been steadily on the tramp since seven in the morning.

Selim now reported that he had been exploring during our absence, and he thought he had seen the Sabaki, judging from some big trees in the distance. We went back, following Selim by another path, along which we continued for some distance over the same kind of country—a large grass plain, with cactus-growth and creepers—and then, the porters being "dead beat," I sent on Selim, Jubah, and Ramazan to explore further.

They returned after a while, saying that there was no sign of the river, but that they had come upon dense thorny scrub impossible to penetrate, and here Selim had heard the growl of a lion close by him as he passed. I told the exhausted porters there was nothing for it but to go back—it was a strange

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country to all of us, and without a guide it was nobody's fault if we had lost our way. These Swahilis are very willing people, and all they said was, *Kwele, kwele, Bwana*—"True, true, master," and off we set again. We had a long hard tramp over the road we had come, still missing the path many times, until at last we got to the lake at about 4 p.m. Never did water taste sweeter to us all than the half-tepid water from this swamp. I had breakfast here, and I thought I should never finish drinking!

In about an hour we started again, and after missing the path several times reached the Sabaki, and camped for the night on the bank. I had a delightful bathe in the river. My cook—who was in great form all day, swaggering about and saying he was a man now, having been in an unknown country—tried to dissuade me from going into the water, as there were many crocodiles here. I said, "Yes, if I was eaten there would be no more rupees!" "Ah," he answered, "it is not that; there will be no more good *Bwana*." Altogether this was the hardest day's tramp I had ever gone through; not counting the time we halted by the lake, we had been fully nine hours steadily on the march, part of it crawling on our hands and knees.

This night I roughed it in earnest, my chair being the only luxury of civilization that I possessed. I tied the lantern to the branch of a tree, and ate my dinner off the back of my writing-board, which made a capital dining-table. My cook was a first-rate servant, and the dinner he was able to give one in the bush was wonderful. The people lay on the ground as usual, close to my tent. In the morning I heard a drum and the sound of voices, which indicated that a village was not far off. At seven we started on the return journey to Makongeni, passing over the same country as yesterday, except that when near the slave settlement we struck into another path and passed a small lake, covered with the usual aquatic plants. We also met two narrow-headed Gallas. These people seem always to carry spears.



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## CHAPTER VII

### MAKONGENI TO TAKAUNGU *vid* FULADOYO—THE GIRYAMA COUNTRY

The Journey to the Coast—Vicissitudes of Native Family Life—Slave Traffic amongst the Native Tribes—Thorny Jungles—Mangea Hill—Heat and Thirst—An Old Camp of Lugard's—Collapse of the Wanika—The White Man an Object of Curiosity—Masai Raids—Agriculture among the Wa-Giryama—Extensive Forests—Fuladoyo—Town of M'Tanganiko—Wanika Settlers—The Liwali of Takaungu—India-rubber Vines—Arrive at Takaungu.

LEAVING a description of the Sabaki district until later, I will continue the account of my tour to the coast.

I now proposed to start on my journey to Takaungu, and sent for the Watoro head-man M'Soma to ask him to supply me with guides. He agreed to do so, but said there was another runaway settlement on the road called Fuladoyo, and that he would give me two men to guide me to that place, where I could obtain others to take me on to Takaungu. The distance to Takaungu could be accomplished by a man without a load in two days, but with porters it would take three days. The distance to Fuladoyo was apparently six to eight hours' march, and there was no water to be found before arriving there. So I bought a supply of native gourds at five pice each to carry water.

In the evening Ramazan gave me an extraordinary and romantic piece of information. He had just heard that his wife, whom he had left at Mombasa, was living in one of the villages here!—she had been kidnapped in his absence, sold as a slave, and had run away to this place. She came to me later on and told me her story. She and two other women



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had gone to see a dance on the mainland close to Mombasa, at a place called Jomvu, and there they had been seized by some runaway slaves, who had stolen all their jewellery and clothes, and then sold them, except one woman who escaped, to some Wanika who intended selling them again to the Gallas. *En route* the two women managed to run away to Makongeni, and had been here for the last month. Such are some of the vicissitudes of native family life in East Africa!

Ramazan wished to take his wife (who was a freed slave) back with him to Magarini, so I arranged that she should come with us next day.

That people could be kidnapped within sight of Mombasa was a little startling. I was not aware before that the Wanika trafficked in slaves, but apparently they do, buying slaves from the runaways, who, although themselves fugitives, are ready enough to do a little business in kidnapping and selling others. The Wanika re-sell them to the Gallas, who keep them for working in cultivating their fields. The Gallas, I understood, will pay two cows for a slave.

The night being again cold, my Wanika slept just outside my tent, and kept up a lively conversation most of the night, while just behind them, Ramazan's wife was relating her story again to her husband and others, until a very advanced hour. The discussion began again very early in the morning—a state of things by no means conducive to sleep. I was at last compelled to remonstrate. In the morning I sent Selim to fetch the other woman who had escaped with Ramazan's wife, as I decided to take her away also and send her back to Mombasa. We left at 7.30 a.m. on September 30, following Mr. Anstruther's road for the first half-hour, and then striking off to the right, through forest land, and past two fine fields of tobacco; the leaves were large and luxuriant, with thick, strongly-marked mid-ribs. We then crossed a half-dried stream with pools of stagnant water, and as there would be no water further on, we filled our bottles here, the porters having neglected to do so in the morning; when drinking my tea at breakfast later on I found the water decidedly nasty, it having a most unpleasant taste. We met several Gallas, all carrying large-bladed spears. The forest gradually decreased

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as I advanced, being succeeded by open glades and a swamp. The path next led through dense cactus and thorny undergrowth, which it was very difficult for the porters to get through. Open bush succeeded, then more cacti and aloes, the red soil being intermixed with gravel and red sandstone, until it became quite stony. The bush became heavier and thicker, with aloes still very numerous. Walking was very difficult, the path being quite overgrown with cacti, which played havoc with the porters' skins and my clothes. After passing through a good deal of this kind of ground the forest began again. The soil here was a light-coloured loam, inclining to clay. Passing over a succession of low ridges and hollows, after three and a half hours' almost continuous scrambling through thick cactus and thorny bush, we emerged upon an extensive flat grass plain, sighting a solitary low hill right ahead called Mangea. This plain was of a yellowish clay soil, which improved in quality as we proceeded; it was sparsely covered with scattered clumps of dwarf bush, with frequent groups of larger trees and better grass.

At noon I halted for breakfast, and to give the porters a much-needed rest, for it had been very hot and the work hard so far. At one o'clock we started off again, and for an hour traversed much the same description of country. We were now abreast of Mangea Hill, about 300 or 400 feet high, and covered with bush and grass. It has a large rock in its centre, and forms a conspicuous landmark in the midst of the extensive undulating plain. We then came on more prickly bush and cacti, the soil below being very white and sandy. Keeping steadily due south, the appearance of the country gradually improved, and there was now open forest and thick undergrowth with a good porous red soil. I halted for ten minutes to allow stragglers to come up. The heat had been intense all day, and everybody had suffered much from want of water, our store having been finished long ago. I gave what remained in my water-bottle to one of my boys and Ramazan's wife, and then waited behind to allow Selim, who was assisting a lame Wanika porter, to come up, keeping the second M'Toro guide with me. After a long time they appeared. The porter, Bikombe by name, besides his load,

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was carrying a lot of Indian corn and tobacco which he had bought on the way; he was naturally dead beat. I ordered the guide to take his load and rest for a short time longer, giving Selim a cigarette, which he much enjoyed. When we resumed our tramp we were miles behind the rest of the people. From 7.30 till eleven we had been traversing heavy cactus and thorny jungle; from eleven to three (with an hour's halt) travelling over a large open plain; and since three o'clock we had been in continuous forest.

We were now nearly at the end of Mangea Hill, and a quarter of an hour afterwards we came upon thicker forest, the trees of which were comparatively small. The soil was a good friable red loam. Beyond this we followed a good road, which I understood had been cut by Captain Lugard. The country now became extremely level, and the trees much larger, with still occasional cacti.

For the next three miles we continued through forest land with occasional open glades, the undergrowth being replaced by numerous lanky saplings growing thickly together. I judged the rain-fall to be light, as, though we had now been travelling down-hill for some time, there was hardly any trace of wash observable; the soil was of a rich black loam, the land becoming now more level till we came out of the forest on to an old fenced camp of Captain Lugard's, and into cultivated country with many papaw trees and pineapples planted along the roadside. We were now in the Giryama country, and presently we met Jubah coming to meet me with water. Further on we met some Giryamas tending a large flock of goats, and shortly afterwards passed their village surrounded by clearings; then along a good path through the forest, passing two more villages. This part of the country appeared thickly populated; the clearings and different villages being divided from one another by uncleared forest, paths diverging to them in every direction. The soil was excellent everywhere.

I pushed on with Selim and one porter, having been obliged to leave the lame porter Bikombe to come on behind with the M'Toro guide; and on nearing a fourth village I came upon all my people quite knocked up. Ramazan told me that on getting near a well—the first they had met since the

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morning—they all rushed for water and said they would die if they had to go further! Fuladoyo was still two hours away, so there was nothing for it but to camp here for the night. Accordingly I had my tent pitched just outside the village, where I arrived at 6 p.m., and allowing for about three-quarters of an hour's halt, we had been nearly ten hours on the road. The Wanika had utterly collapsed—the want of water seemed to try them more severely than the others; and

WA-GIRYAMA.[1]

if it had not been for them we should have been able to get on to Fuladoyo that evening, as the Swahilis were all right. As Bikombe did not turn up, I sent a guide back to look for him; but finding next morning that he had not yet come in, I left word with the Giryamas to send him on to Fuladoyo.

I was the first white man to visit that village, and was the centre of much curiosity; the Giryamas crowded round my tent all the evening, watching my every action—especially

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while at dinner. Eating with a knife and fork seemed quite an exciting performance: every time I put my fork into my mouth, they nudged each other and said, "Look! he is doing it again." Dressing-time in the morning was most embarrassing, the ladies especially being most interested in every detail of my simple toilette—very trying to a modest and bashful man!

It had been terribly hot all day, and so I ordered Ramazan

A WA-GIRYAMA FAMILY.

to have everything in readiness to start at daylight next morning.

I saw the Giryama village head-man in the morning and explained the objects of my visit to him, and made him a small present; he told me that this part of the country was called Mangea, after the hill. Leaving the village at 6.30 a.m. we followed a good path through fine forest, the lay of the land being gently undulating. Numerous villages and culti-

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vated clearings were scattered here and there, the larger trees being left standing. Cattle were comparatively scarce, fear of Masai raiders deterring the Wa-Giryama from keeping large herds, but they possess large flocks of goats which graze over the clearings when the crops are harvested, and thus a great deal of what was once forest is now grass and scrub. The soil was everywhere excellent.

The products cultivated by the Wa-Giryama appeared to be—

*Maize*, very extensively grown both for food and sale.

*Castor-oil*, grown in patches amongst the maize; it grew well.

*Beans and Pulse* were also a great deal grown.

*Tobacco* grew most luxuriantly. The flower was white, and the leaves I noticed were stripped from the stalk, which was left on the ground. Here, as in Jelori, they allowed the plant to grow too high; if it was topped the leaves would be larger.

*Tomatoes and Sweet Potatoes* grew well, and were largely cultivated.

Each village, I observed, had a substantial hut, generally the largest in the place, in which the harvested maize was stored. The country appeared well populated, and paths led off to the villages in every direction. In one hour and a half I passed seven villages on the path itself. In one I noticed a solitary pepper plant (capsicum). Guinea-grass was growing everywhere; it is always an indication of a rich soil.

The path continued through a succession of clearings which were divided by belts of forest, and reaching some rising ground I obtained a good view of the country lying eastward towards the coast. All was apparently forest land and very flat. An hour and a half after starting we passed through a large, cultivated valley, surrounded by low hills covered with forest, with a small sluggish stream flowing through it. I noticed there was a much heavier wash here, indicating a greater rain-fall. Ascending the ridge, I saw Fuladoyo lying in the valley below, and arrived there at 8.30 a.m.

Fuladoyo, named after a low hill close by, was another large Watoro or runaway settlement, with neat, well-kept houses, and a good deal of cultivation surrounding it.

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Bananas, cassava, and tobacco were all growing abundantly in a good red loamy soil. Rice, I may remark, I saw only at Jelori and Makongeni.

I paid off my two guides from the latter place, taking two more on from Fuladoyo and starting off again at 9.30 a.m. We continued due south over low hilly country with scattered Giryama villages and clearings, and then along a dry rocky water-course. Eventually the forest became thinner and the country more broken, and I crossed the dry bed of a third water-course with pools of water in it, the bed consisting of large slabs of rock. There was good grass in the glades, and on them large flocks of goats with a few cattle were grazing.

At 11.30 a.m. I came on two water-holes carefully fenced round; the water, though muddy, was very refreshing to us all. Passing over some steep low hills and valleys beyond, I noticed that rain-wash was more marked, as evidenced by the channels cut in the soil by the rush of water in the wet season. The country throughout was thickly populated, and I had passed so far fourteen villages on my way. This hilly country continued till about noon, when the land became more undulating, with fine wide valleys extensively cultivated with the usual products, maize (just harvested) and castor-oil. In one of these we crossed another small river, the fourth, with a very deep bed, and with a rapid current.

The soil of the valleys was a rich chocolate, intermixed with patches of red loam.

At 12.30 I halted near a large fenced pond to have breakfast whilst waiting to allow my porters to come up; the lame porter Bikombe had rejoined me at Fuladoyo, and I hired a man from there to carry his load.

Starting off again at two o'clock we passed through some beautifully fertile country with an abundance of luxuriant guinea-grass, the soil a red to chocolate-coloured loam. For the next two hours we continued through forest land with scattered Giryama clearings; the amount of maize cultivated about here must be very large, and the same may be said, in a lesser degree, of castor-oil.

Emerging at last into a more open district we traversed a fine park-like country with many grassy valleys, and after

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crossing a larger one with a brackish stream flowing through it, found, on ascending the opposite ridge, that we had at last arrived at M'Tanganiko.

M'Tanganiko is a small Swahili town, built on a ridge surrounded by a few lanky coco-nut trees, and divided by a deep valley from a river with a constant supply of good water. Several Indian merchants reside here, and carry on a con-

NATIVES OF M TANGANIKO.

siderable trade with the Wa-Giryama in maize, tobacco, and gum-copal. I went through the town, crossing to the other side of the valley where I camped near the river; meeting no end of women and children on the way carrying water from it. I noticed that empty kerosene oil tins were used for this purpose. I camped at 5.30 p.m., having been on the road since 6.30 a.m.

My people informed me that Salim bin Hamisi, Liwali of

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Takaungu, was at present at M'Tanganiko. He sent some of his askaris to greet me, apologizing for not coming himself as he had a sore leg; and with many compliments presented me with a sheep, a couple of fowls, and a lot of eggs.

There were a great many Wanika settled round here, and some of my Wanika porters had relations—brothers, etc.—amongst them. I was very glad of this, as I hoped they would spread the news that I was employing Wanika as paid labourers at Magarini. There was heavy rain during the night, which was rather hard lines on my people after their long tramp; but the Wanika all slept in the village of their tribesmen close by.

Next morning was still rainy. I called on the Liwali, an elderly Arab, possessing a large area of land in this district. When I told him the object of my visit, and asked for his help and assistance, he said that he was detained here on business at present, but promised to meet me shortly at Takaungu. I therefore returned to camp, and finding my loads already packed I left immediately for Takaungu. I crossed the river, which flows through a narrow fertile valley with rich loamy black soil—the vegetation, especially guinea-grass, being most luxuriant—and then passed over a series of low hills covered with grass and bush, everything looking very green and luxuriant after the heavy downpour of rain the night before.

Marching was rather difficult, as the path simply went straight up one hill and down the next. From their tops a good view was obtained of the surrounding country, which consisted of a succession of low hills and valleys covered with rich vegetation. The soil was excellent, a chocolate loam.

On the left occasional glimpses were caught of what I thought at this time was the river Kilifi, but afterwards learnt was the N'Zovoni river. At 8.30 a.m. we descended to a sandy back-water, with a good many mangroves, and surrounded by low hills. We followed this for an hour, and then, after ascending a steep bank, came upon an extensive stretch of level and fertile country, covered everywhere with low bush and grass, and here I obtained my first sight of

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indiarubber, a woody climber, a species of *Landolphia*, growing extensively in the forests bordering the coast. I passed vines repeatedly as I went along, but none of those that I saw were thicker than one inch in diameter. My guide told me that although indiarubber existed around here in large quantities, none of the vines were very large ; this I dare say is explained by the absence of large trees in the bush.

After a short interval I came upon the regular coast cultivation and shambas. Stretching away on every side were flourishing fields of maize, cassava, and sweet potatoes, with many houses surrounded by coco-nut and mango trees. The soil everywhere varied from a fine chocolate to loamy black. The country here may be described as a large plain traversed by deep, narrow valleys. Although the country appeared well populated, and everything seemed to thrive luxuriantly, there was a considerable amount of uncleared bush, amongst which small indiarubber vines grew plentifully ; guinea-grass, too, was everywhere abundant. I crossed a second back-water of the same description as the first, the descent to which, as well as the ascent from it, was very abrupt. It took twenty minutes to cross. On the opposite side was the same flat, fertile country as before, alternately thick bush and cultivation, the latter chiefly sim-sim. Takaungu was reached at noon, four and a half hours from M'Tanganiko.

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## CHAPTER VIII

### TAKAUNGU—ROKA—M'SHAKA IN THE INDIARUBBER DISTRICT

Takaungu and its Chief Products—A Drunken Brawl—M'Narani—Kilifi Bay—Cross to M'Tondoa—Wild Cotton—Thick Forest—Roka—Coral Rock—M'Shaka—Among the Rubber Vines—Method and Time of Collecting—The East African Rubber Trade.

I PITCHED my camp in the middle of the town, and was immediately surrounded by a large crowd of people—indeed, during my whole stay in the place there was generally a crowd watching my doings, although they always had the politeness to retire to a distance during my meals. A small boy, an idiot, with an extraordinary resemblance to a monkey, was a never-failing source of merriment to my Wanika, who were in great spirits now that they were homeward bound. The boy in question was a Wanika by birth; his people had wanted to kill him on account of his deformity, but the Liwali had interposed and was now keeping him in the town. My camp was under a tree near a large stone well, and my people had the unaccustomed luxury of a roof over their heads. I had got on wonderfully well with them, Zanzibari porters and all; my tent was made the depository of everybody's private possessions—tobacco, Indian corn, rice, etc.—and I found that by treating them with sympathy and kindness it was easy to win their confidence and cheerful obedience. From the curiosity displayed by the inhabitants of Takaungu, they were evidently not accustomed to seeing such strange visitors as Europeans.

Takaungu is a large native town situated on a beautifully winding narrow and shallow inlet of the sea, and has a



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considerable population, consisting of Swahilis, Arabs, and Indians. The scenery looking seaward is very fine and impressive. The town consists of a large number of houses, built of red earth, and thatched with grass or coco-nut cadjans, many having small gardens enclosed by a high close fence of metamah stalks, in which tobacco, pumpkins, etc., are cultivated. There are two fine wells built of stone. Many coco-nut trees were growing about, with a few groups of fan-palms, and a small number of betel-nut palms. I traversed the town throughout, and found it very large, with numerous narrow streets; I also visited the bazaar, where I saw a

SWAHILI WOMEN.

great many Indian shopkeepers and merchants. There was also a quaint prison with battlements, from which one got a good view of the town.

The appearance of the country round about presented much the same appearance as round Melindi—gently undulating land, with low bush and scattered baobab trees; these, however, were very much larger here. The cultivation was all open, and the luxuriance of the guinea-grass testified to the excellence of the soil. There were a few mango shambas, with some scattered coco-nut trees; but the latter, I was given to understand, did not thrive, growing well until mature, when they became weakly and died off. This may

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be caused by want of care in cultivation; coco-nuts will *not* bear neglect, and a good many growing round here were simply choked up with grass and bush. The coco-nuts growing in the town itself were better looked after, and though certainly not so robust as those growing in the Melindi district, yet they appeared healthy enough. In some cases the decay might be due to the roots coming in contact with the coral rock below; for, generally speaking, I saw no reason why, with proper care and drainage, they could not be made to thrive. The Liwali, Salim bin Hamisi, possessed, I believe, only one coco-nut shamba, the rest of his property being all under open cultivation. The chief crop here was undoubtedly sim-sim. I traversed a considerable extent of land covered with it, of excellent quality and vigorous appearance. The first crop had been harvested, and the second was now growing, and was of an average height from 4 to 4½ feet high. Maize, Congo pea, beans, and pulse often being cultivated in the same fields, the soil being of a good brown loam.

Taking into consideration the large area available, the cultivation was comparatively small, large tracts of bush intervening between the shambas. The baobab trees were exceedingly large, the largest I had yet seen.

Apparently but little millet was grown, but the maize cultivation was very large. I saw but few bananas, and those sold in the town were of the large coarse variety.

The price of the various products was as follows—

| | | |
|---|---|---|
| Green coco-nuts | ... | 1 pice each. |
| Dry „ „ | ... | 6 „ „ |
| Bananas (bunch) | ... | 6 annas. |
| Sim-sim (sesame) | ... | 4 dols. to 5 dols. per gisla. |
| Indian corn | ... | 2 dols. per gisla. |
| Beans ... | ... | 3 dols. to 4 dols. per gisla. |
| Rice ... | ... | 10 rupees per konda. |

N.B.—Only a small quantity was grown here by the Wanika, the rest being imported from Mombasa.

| | | |
|---|---|---|
| Indiarubber | ... | 1 rupee per lb. |
| Gum-copal | ... | No information. |

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The collection of the gum-copal is confined to Giryamas, who brought it in for sale.

Besides the above, raggy (*Eleusine coracana*) was grown to a limited extent. A large trade is carried on between Takaungu and M'Tanganiko and the Giryama country. Ivory is also brought down from the interior by caravans. The path between the two places is very bad, and there is no doubt that good roads would do much to open up the country. Camels were not used, but donkeys are principally employed as transport animals.

I went out in the afternoon to visit the country to the south of Takaungu, and was very much struck with its appearance; it can be described as a beautiful fertile plain. The soil was excellent, of a free friable chocolate loam, with that total absence of stone so characteristic of the coast lands. I passed first through a small coco-nut shamba, the trees being all young and healthy, with sim-sim and sweet potatoes cultivated beneath. Then came another coco-nut shamba, the trees also young, and planted about 30 feet apart; I next passed through a large field of beans and cassava.

I noticed a fine wild cotton plant (*Gossypium* sp.—three-pointed leaf, staple medium, large black seeds) growing in a shamba; and close by was a fine stone well with pulley and bucket—the first I had seen, the usual method of drawing water being with a baobab fruit calabash attached to a fibre rope. Beyond this I passed a third and very extensive coco-nut shamba, but the trees were all choked up with bush and grass, bearing out my previous remark on this head. The path now led through patches of bush, thriving fields of cassava, beans, and sim-sim, more neglected coco-nuts, and some fine papaw trees and castor-oil plants. I next passed through some extensive cultivation of maize and sim-sim, well weeded and cared for. The maize in some places was between 6 and 7 feet high. The soil was so rich that cleared land, if neglected, almost immediately reverted to bush. I was now following the telegraph-line between Melindi and Mombasa, and noticed many small rubber vines in the bush as I passed by. Shortly afterwards I came upon an extensive flat open plain with immense baobab trees; here

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also was a large cultivated area with some fine mango plantations. This beautiful level country, with its uniform rich soil of a fine friable chocolate loam, is admirably adapted for the plough, and with a better system of cultivation should yield magnificent results.

I returned by another way, describing a complete circuit over a large area of country, and was much impressed with the appearance and fertility of the country, of which only about one-third appeared to be cultivated.

It was dark when I got back to camp, and late in the evening, after dinner, I heard a tremendous row going on. Soon afterwards a man was brought to me streaming with blood; he had been fighting with another man and was badly wounded about the head. I washed and dressed his wounds, and told the people who had brought him to me to take him and his antagonist before the cadi; but they only laughed, and said such fights were common amongst them. They certainly seemed a lawless lot.

I remained altogether two days at Takaungu, leaving for Kilifi on the afternoon of October 4. The Wanika porter, Bikombe, I left behind with some of his friends at M'Tanganiko; he was too lame to keep up with us, so having paid off the man hired in his place at Fuladoyo, I got a Wanika here who agreed to accompany me to Magarini.

I had to go through the town to get to the bay, down a slippery and almost precipitous descent, which might have been improved with very little trouble. We punted across the shallow bay in a large canoe. The view from the water, looking up the precipitous shore to the town, with its red houses nestling among the coco-nut trees, was most picturesque. The opposite bank was also high and steep, with the same flat fertile country as round Takaungu. I travelled along the telegraph line, below which an excellent road had been cut, diverging now and again to look at the country on either side. It was all thick bush with the same rich loamy soil. In half-an-hour we came upon scattered fields of sim-sim and maize; then, after more bush, arrived at M'Narani shamba, situated on Kilifi Bay, which is about five miles from Takaungu. M'Narani was a large shamba of open cultivation



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with numerous coco-nuts and some fine mango trees. A substantial house had been erected here by the Company, and close by I found Bell-Smith, now in charge of this district, camped under a large mango tree, where I joined him.

The next day I spent quietly, and enjoyed the rest, the first I had had since leaving Melindi. The *Henry Wright* happened to be anchored in the bay, and as she was going to Mombasa, I took the opportunity of sending Ramazan's wife and the other woman I had brought from Makongeni by her, with a letter explaining the circumstances.

Kilifi Bay is a long winding inlet with high precipitous banks, very deep and narrow opposite M'Narani, where the Company's Custom House and some fishermen's huts are situated on the shore below the cliffs. It opens out widely further inland, forming an excellent and well-sheltered harbour, then it goes winding out of sight towards Konjora. The telegraph-wire is stretched across the bay from tall posts on either side, high enough to admit of the passing of cruisers below; it is a wonderfully wide span.

The great drawback to the place is the want of good water, the only supply being rather brackish. The scenery is wonderfully wild and beautiful. This neighbourhood is noted for its many poisonous snakes, and as our camp was surrounded with high grass, it was rather risky going about, especially at night, but fortunately I did not come across any.

I started next day (October 5) on my journey to Melindi, sending on my tent and porters about noon to M'Tondoa, a Swahili town about five miles from Kilifi, I following later. My people were taken across the bay in a large dhow, and I went about 2 p.m., rowing across in a small canoe. The ascent on the opposite side was high and steep, and I came upon very much the same kind of country as before—mostly flat and bushy, with detached fields of sim-sim and beans. The soil was a rich chocolate loam. I had been told at Kilifi and Takaungu that I should see a good deal of diseased metamah along here, but I only passed two withered fields of it. I made special and careful inquiries concerning it from several native gentlemen of experience, who told me that the

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death of the half-ripened crop was not due to disease, but solely to the fact that the seed (second crop) had been put down too late in the season. There was a slight rust on the leaves, but this had no prejudicial effect.

After traversing a few more detached fields we passed into forest again, and I had my attention drawn several times to elephant tracks. Rubber vines were fairly plentiful here. After leaving the forest we passed a good deal of abandoned land, now grown up chiefly with guinea-grass; then cultivation once more, the harvested fields being planted with the second crop of sim-sim, cassava, beans and pulse, etc. We now came upon the first houses of M'Tondoa, a long straggling town; the houses were generally thatched with grass—showing the absence of coco-nuts, the people much preferring the matting made from coco-nut leaves when obtainable.

I found my tent pitched in the middle of the town, and whilst enjoying a welcome cup of tea I had a talk with the owner of the largest plantations, who had been waiting to welcome me. In the evening some of the principal inhabitants came to see me, and on my questioning them as to this supposed metamah disease, they gave me the same explanation, which was subsequently confirmed from other sources.

On asking them the reason of the absence of coco-nut cultivation round here, they gave me much the same explanation as I had already heard at Takaungu, that the coco-nuts throve when young but died off gradually as they became older, and one of the Arabs offered to show me a shamba next morning of dead and dying trees.

It was in M'Tondoa that I saw the fourth wild cotton plant, the first being at Gongoni, the second in the forest between Melindi and Jelori, and the third at Takaungu. The four plants belong to two species, *Gossypium barbadense* and *G. arboreum*.

Next morning, October 7, I was taken to visit the dead coco-nuts; they were in an old neglected shamba, which my guide admitted had been abandoned for some time; there were a few trees still surviving, but the land had simply reverted back to bush, and no wonder the trees had died, for the coco-nut is, above all trees, particularly sensible to

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neglect. A few trees growing in the town were mature and full-grown, and appeared healthy enough; I consider that neglect was the sole cause of their failure both here and at Takaungu. When young the trees are cared for; for while ground produce is grown for the first two years the ground is kept clean and weeded, but when this is discontinued, the soil being so rich that the bush—never rooted out but only cut down—soon springs up again, the trees have their further growth checked by the rank vegetation quickly crowding up around them.

NATIVE SHAMBA, M'TONDOA.

I give for comparison the prices of coco-nuts in M'Tondoa, Takaungu, and Melindi—

| | M'Tondoa. | Takaungu. | Melindi. |
|---|---|---|---|
| Green | 1 pice. | 1 pice. | 1 pice. |
| Dry | 3 to 4 pice. | 6 pice. | 2 pice. |

Leaving M'Tondoa, I passed through fine forest-land and one cultivated shamba, the path then leading through unbroken forest extending from the sea to the Giryama country. The lay of the land was very flat, the soil a good chocolate loam and very rich. As I proceeded the forest became thicker and heavier, and I frequently noticed rubber vines as I passed by, and was told that they were very plentiful all round here. It

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occurred to me that this forest offered a fine field for experimental rubber cultivation; as apart from the *Landolphiæ*, experiments could also be tried with *Castilloa* and Para rubber.

I continued through thick and unbroken forest for nearly three hours, then emerged upon a fine stretch of cultivated land, extending on both sides for a considerable distance, and consisting of harvested millet fields, beans, sim-sim, "wimbe" or raggy, and maize, the lay of the land being gently undulating. I then plunged into forest again, and after a march of twenty minutes, emerged suddenly upon Roka, which is a fairly large town with good houses, and a few coco-nut trees growing in and around it. I here saw a solitary specimen of the Pemba dwarf coco-nut, loaded with fruit; it was apparently much valued, as it was most carefully fenced round.

Roka boasts of a fine stone well, near which we halted. Coco-nuts were very scarce, and the people seemed very loath to sell some green coco-nuts I wanted for drinking, preferring to keep them for sale when ripe.

We left at 1.30 p.m., passing at once into a low flat valley, evidently flooded in the wet season, the soil of a black clay. The Roka people had another well here. I passed several more of these low grass-valleys with much the same characteristics as the first, divided by belts of forest, which eventually continued without a break, the land very flat and the soil an excellent black loam. I saw no rubber.

We were gradually getting nearer the sea, and after marching through more open country with a good deal of coral outcrop, we came on an open grass-plain close to the sea-shore which was thickly fringed with mangroves. We passed a good deal of coral rock, thick forest and bush continuing uninterruptedly on our left, arriving at M'Shaka at 3.30 p.m., about six to seven miles' distance from Roka.

M'Shaka was a large open shamba belonging to the Liwali of Takaungu, with a slave village where many professional indiarubber gatherers come to reside during the rubber season, ten of them being there at this time. The cultivation round M'Shaka was very small considering the large area available, and consisted of the usual ground

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products; I saw no coco-nut trees. My head-man Jubah gave me another striking proof of his usefulness to-day! I had sent him on ahead with the porters to give word of my approach, to find a good camping-place, and have everything ready for my arrival. I found him quietly sitting on the ground chatting pleasantly to a number of people and not a thing done!

My tent was soon pitched, however, under a fine spreading tree close to a house where some rubber gatherers were living. I was now in one of the best rubber-yielding districts, and was anxious to obtain all the information I could concerning it. I had a long talk with the rubber gatherers in the evening, and arranged for one of them to come with me next day and to show me their mode of gathering it. There was some very fine timber all round here.

As will be seen from my previous remarks, the country is here covered by extensive forests, extending on the north up to Jelori, on the south down to Takaungu, with a few breaks and patches of open cultivation; on the east it is bounded by the sea, and extends on the west far up into the Giryama country which I had just traversed. Indiarubber vines are plentiful in the forest along the sea-shore, and for some distance inland; they then cease, being comparatively rare as one proceeds into the interior, though frequently met with up the Sabaki. The chief collecting grounds are undoubtedly along the forest more immediately bordering the sea, and in the portion between M'Shaka and Melindi the vine is found in particular abundance, and it was this district, known as Aroboko, that I was particularly anxious to visit. In the morning Ramazan reported that the indiarubber gatherers now refused to come and show me the way they gathered rubber, as the Liwali's slaves had told them I had no order from him, and that the real reason of my coming was to stop their trade. This was the first time I had had any trouble with the people, and after a little negotiation I succeeded in getting another man to go with me, though he said the slaves would make it unpleasant for him when he came back. As the other gatherers were in a hurry to be off I at once started with them. I followed my guide along the telegraph-line

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close to the sea-shore, across large open sandy back-waters, the shore being fringed with mangroves; on the left the forest continued. The guide then struck off to the left through some grass and forest, and very soon afterwards we found ourselves amongst the rubber vines. They were certainly very numerous, climbing up into the trees in every direction, some of them as thick as a man's wrist. The vines were without leaves, and looked like thick ropes hanging down from the branches.

The method of extracting the rubber I found to be as follows.—The collector makes a series of circular incisions around the vine with a knife at intervals, and then dipping his hand into a pot of salt water, he smears it over the cut portions, from which the milk is exuding, causing it to coagulate at once. The rubber is then collected, commencing at the first ring, and the rubber gathered from this is rubbed over the second ring, and so on, the quantity gradually becoming larger as the collector proceeds; he gives the rubber a circular motion as he rubs it over each cut, thus giving it its ball-like appearance. The gatherers generally stop by noon, as the milk does not exude so readily when the sun becomes hotter. There is no collection of rubber, to speak of, during the dry season; the collector told me they generally worked during six months. It is only when the milk is becoming scarcer at the end of the wet season that this salt process is used.

In the regular season the milk is gathered by scraping it off the cut, putting it in a collecting pot, and in the evening boiling it for one hour.

In the season a man can collect in a day from three to four pounds; at the time of my visit the amount was only from half-a-pound to a pound. All the vines that I saw bore marks of having been bled; on questioning my guide, he said he had not noticed that any vines had died from excessive tapping, but this statement I think should be accepted with considerable reserve. The collector stated that it was in the forest round Aroboko that the more valuable vines were to be found.

The collectors were all free people, chiefly Guniahs, and

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came from all parts of the country from Melindi to Takaungu; my guide, and several other collectors who joined him later on, came from the latter place.

The vines were all a species of *Landolphia*, and this was my first acquaintance with this variety, my previous knowledge having been confined to the South American varieties. For all known information concerning the East African rubber vines the world is indebted to the valuable researches of Sir John Kirk, carried on when he was her Majesty's Agent and Consul-General at Zanzibar; and I was personally greatly indebted to his various reports on the subject for my ability to classify the varieties growing in the coast regions, which I believe to consist of four, viz. *Landolphia florida*, *L. petersiana*, *L. owariensis*, and *L. Kirkii*, named after Sir John Kirk, the discoverer, and yielding the best rubber, which is of a pink colour.

The present system of collecting, as I saw it, left very much to be desired; the use of salt water is especially to be condemned, as it renders the rubber wet and spongy. I have entered into the subject so exhaustively elsewhere[1] that I will not add more here, beyond remarking that the poor prices realized by African rubber are undoubtedly due to want of care in the preparation, and frequently to adulteration with heavy substances, stones, etc., to add to the weight. It is my firm impression that indiarubber is destined eventually to prove one of the most important exports of the country, and in view of the increasing demand in so many branches of manufacture too much attention cannot be given to it. As an example of the good quality of the rubber obtainable even by their imperfect native methods, a sample submitted to a leading firm of brokers in 1890 was reported upon as follows—

"Ball fine, free from sand or wood; this quality is very desirable, as so much of the rubber which comes in is mixed with sand, wood, or barky substance. Such as yours, owing to the market being very firm, would bring 2*s.* 5*d.* to 2*s.* 6*d.* per lb.," the top prices then ruling.[2]

[1] See Appendix D.

[2] For further information, see Appendix B.

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## CHAPTER IX

### GUM-COPAL TREES—AROBOKO TO MELINDI—SEARCHING FOR A SLAVE CARAVAN

Gum-copal Trees—Aroboko—A Well-cultivated Valley—Wasania Village —Return to Melindi—Pay off my Men—Untrustworthiness of Ali bin Jumah—Small Troubles—News of a Slave Caravan—Once more on the March—The North Bank of the Sabaki—The Wakamba Tribe —Guarding the Roads—River Fords—A Trackless Wilderness—Arbagundi—Camping under Difficulties—Native Simplicity—The Wa-Galla—Insect Plagues—Crocodile and Hippo Lakes—A Village Fire —Snakes—Back to Jelori.

AFTER my visit to the rubber vines, I made my way back through the forest to the sea-shore, till I struck the regular track leading to Melindi. This I followed till 9.30 a.m., when I came on the path branching off to Aroboko, my destination. So far, that is from Takaungu northwards, I had been travelling more or less in a line with the sea-coast, but the path to Aroboko now led off at right angles to it. A fine land-locked lagoon surrounded by mangroves is a noticeable feature here, and I passed a pile of timber roughly dressed by the axe, stacked close to the path awaiting shipment to Mombasa. Our way led through a thick forest, the soil being of a white to grey sandy loam. I noticed a large number of gum-copal trees as I passed: they are most handsome trees, with a tall straight stem and a white silvery bark, much resembling birch, and yield the well-known gum-copal varnish of commerce. The tree grows in great abundance in the forests throughout the Giryama country, and belongs to one of the most valuable varieties of copal-bearing trees, viz. the *Trachylobium hornemannianum H.*, from which the Zanzibar copal or *Animi* is obtained.



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The collection of the gum is apparently confined to the Giryamas. It is obtained from the stems of living trees, and from the roots and cavities of dead trees; two pints of gum from seven trees appearing to be an average yield. The Giryamas sell it at a very low price to the merchants on the coast, but the information which I obtained as to prices was not reliable; these, however, depend upon the quality of the gum, the black-coloured being less valued. Every tree that I passed had been a good deal hacked to obtain the gum. Surely a better method could be found, for this causes a good deal of unnecessary injury to the trees.

Continuing through the forest, the character of the land was as usual very flat (the soil of a uniform whitish-grey sandy loam), and the whole country was thick forest, which extended on every side. This continued till 11 a.m., one hour and a half from leaving the coast, when I suddenly emerged upon Aroboko, a village belonging to the Liwali of Takaungu's brother; a strongly-palisaded slave settlement, possessing a good well yielding a constant supply of water. The owner's son was living here at the time, and showed me every attention. Aroboko marks the beginning of cultivation, for the forest now ceased, and with the exception of the usual intervening tracts of bush and abandoned clearings, cultivation extends up to Melindi, about four hours or thirteen miles distant.

Apart from the slave cultivators, a good many Guniah rubber collectors were living here, the surrounding forest being rich in rubber vines, and a large quantity of gum-copal is obtained by the Wa-Giryama, who have several villages close by, from numerous trees growing in the vicinity. Aroboko is well situated on the edge of a low flat valley, in the centre of which is a swamp, which becomes a miniature lake in the wet season, with 4 to 5 feet of water. The whole valley is well cultivated—a few citron trees were growing here, and were loaded with fruit, and some coco-nut trees were thriving most luxuriantly in the grey sandy loam.

I had my tent pitched inside the stockade beneath some fine silk-cotton trees—the biggest I had yet seen.

The Gallas gave some trouble when this plantation was

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first opened up, and the village had to be stockaded to resist them. I much enjoyed my stay in this quiet place, taking several strolls into the surrounding forest, and admiring the numerous fine trees.

In the course of the afternoon I went to visit a Wasania village situated on the opposite side of the valley, the residence of the principal Wasania head-man, named Mote. The huts are small conical erections built of grass, and with one narrow entrance. The women wear a curious head ornament made of brass and beads, with a large number of red-and-white bead necklaces, whilst their arms and legs are covered with brass rings. The Wasania are chiefly a hunting tribe, and their villages, mostly situated in the forest, are scattered over a large area of country. On subsequent occasions I found them most useful as guides, and they appear to be a simple and well-disposed people.

I left Aroboko at 6.30 next morning (October 9), for the last stage of my journey to Melindi. My Wanika porters were in the wildest spirits at the prospect of getting home again, and led off singing and shouting, at a pace that soon left my worthy head-men Baba and Jubah miles behind. The path led at first through abandoned land overgrown with thick high bush and grass, amongst which guinea-grass was particularly plentiful, the soil being still of a light grey friable loam.

Three-quarters of an hour after leaving Aroboko, cultivation again appeared, the land here being gently undulating with some fine flat valleys—the soil now changing to a rich chocolate loam.

In another three-quarters of an hour I came on the first village and coco-nut shamba, with open fields, continuing afterwards through a fine fertile country with extensive coco-nut plantations and numerous villages on every side, many mango trees being scattered about. The soil was excellent, a fine friable chocolate loam—this portion of the Melindi district appearing as fertile as the rest, though there were here also large tracts of abandoned and uncleared land.

I finally reached Melindi at 10.30 a.m., four hours after leaving Aroboko, my expedition having taken thirty-six days.

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I went straight to the Liwali's shamba, which I had previously found a most comfortable camping-place, and had my tent pitched under a large spreading mango tree, with a good well close by, and a view of the sea from my tent. The shamba was a little outside the town—a decided advantage!

I reported myself at the office on my arrival, and had breakfast with Anstruther. In the afternoon I paid off my large following, returning my surplus ammunition to the stores, pleased to think that the few cartridges expended had been fired solely in friendly salutes. My Wanika were so anxious to go home, that I paid them off and let them go at once, and arranged for some of the estate people at Magarini to come for my things.

I was detained at Melindi on various matters, finally starting for Mombrui on October 12. I walked by the sea-shore, Anstruther coming a part of the way with me. I had sent my things on ahead, so that on leaving Anstruther I found myself alone, which, after the crowd of people I had lately had always around me, felt quite odd. I crossed the Sabaki all right, and found a couple of donkeys waiting on the other side, together with some most welcome green coco-nuts, sent by my ever-thoughtful friend, the Liwali of Mombrui, by whom and the elders I was most cordially welcomed on my arrival, the Liwali insisting on my stopping at his house as before. I was very sorry to receive unsatisfactory reports of Ali bin Jumah, the overseer at Magarini—whom, by the way, I had found at Melindi, and had at once sent back to his work with a sharp reprimand.

I was now told that Mr. Ali was strongly suspected by the Liwali of having sold a certain amount of estate produce and coco-nuts for his own profit. The Liwali had a bad opinion of him, remarking that "big talkers were never worth much."

This was not encouraging, and made me rather distrustful of the Swahili character. The Liwali admitted that everybody cheated and stole who got a chance; he also told me that, having questioned Ali one day about some trivial theft of a balance of money left over from the purchase of some rope, Ali bin Jumah exclaimed: "Was it worth my while to steal only a rupee and a half!"

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I returned to Magarini early next morning, and determined to hold a strict inquiry into this and other matters. I found everything very satisfactory, and was much pleased with the appearance of the cotton, which had come on very well, though rats had destroyed a good deal of the last-sown seed, leaving a good many vacancies. In the general report on the estate works given me by Ali bin Jumah, he emphasized the fact that he had *not yet* begun to gather coco-nuts. There was, of course, a crop of small troubles awaiting me: one of the estate donkeys had run away, and had not yet been found; there were disputes to settle among estate hands; and a native tailor, whom I had got up to teach some of the younger boys what I thought was a useful trade, had not only run away with his three apprentices, but had stolen a lot of clothes which he had orders to make, besides having borrowed money right and left. I soon had him caught and punished and recovered the boys.

I now hoped to settle down at Magarini, where a good many things demanded my attention, but I had to set off on another expedition sooner than I expected, for two days after my return I received, on October 15, a confidential letter from Melindi, advising me that from information received at Mombasa, a slave caravan estimated at about seventy souls was coming down the Sabaki route, and was evidently bound for Mombrui. The Administrator desired me to do my utmost in co-operation with the Company's officer at Melindi to intercept it. This, I may explain, was one of those trading caravans to the interior which combine slave-trading with their legitimate business, and try to run their contraband human merchandise to the coast unobserved by the authorities, and thence ship them for sale to Pemba or Muscat at the first opportunity.

Mr. Wilson, who was at Melindi just then, and with whom I was to co-operate, was proceeding up the Sabaki by the south bank, so I settled to go up on the north side. This part of the country being quite unexplored, I had to make some preliminary inquiries about the way, which I did as quietly as I could, so as not to cause alarm. I announced to Ali that I was merely going up the river a little on the south side to

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have a look at that part of the country with a view of extending cultivation, at the same time ordering him to send me up ten good men with guns, and a Nakoa in charge of them to whom he was to give his own Snider. I had only received my instructions in the afternoon, and by the time I had made my necessary arrangements, it was too late to start that evening. At daybreak the next morning I was on the road, my small force numbering twenty-five people, as follows—

Ten armed men with one Nakoa.

Eleven porters carrying my kit and food for the people, Ramazan, my cook, and servants.

I had ascertained that a direct path from the interior existed on the south side of the river coming down from Makongeni to Mombrui, and that a path to Magarini branched off from it. This was the road generally taken by fugitive slaves on their way to Makongeni, and by the Arabs in their various expeditions to attack the runaway-slave settlements, so I thought it most probable that the caravan I was in search of would follow this route.

I therefore started off with my people along this path, and after passing over many low swampy grass flats, we stopped to obtain a supply of water from a hole at about an hour's distance from Magarini, as further on, I was told, the water was brackish. I was the object of much curiosity to the Wanika of a village close by, being, I believe, the first European who had passed that way.

After passing chiefly through open country with intervening belts of forest, I joined the direct Mombrui path near a large pond of brackish water, and about eight to nine miles' distance from Magarini. Here I halted to snatch a brief meal and rest my people. We then continued in perfect silence, I leading with the armed porters, Ramazan and the other porters following a little behind. Further on the country became more undulating with thicker forest and occasional open glades; a good many of the hollows looked as if they were flooded during the rains, the soil being a stiff black loam.

About four miles further on we came upon a shallow lake with good water, lying to the left of the path, and got a good view across it of Sekoki Hill and Jelori. This lake must be

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WATCHING THE WHITE MAN PASS.

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fairly extensive in the rainy season, as there was now a good deal of water in it. We went on a bit further trying to find a Wanika village that we had been told was situated about here, but were unsuccessful, and as it was getting dark, we made our way back to the lake, and camped by it for the night. I arranged my men into watches, putting an advanced outpost forward on the path, and took it in turns with Ramazan and the Nakoa to visit it during the night, which however passed away undisturbed.

I thought at first of waiting here for the caravan, but on reflection I concluded that it was too close to Mombrui, for so many Wanika passed up and down that the report would soon have spread that I was blocking the road. There were many native villages scattered about, but they all lay closer to the Sabaki, and after leaving the Wanika clearings near Magarini, I did not pass any village or signs of cultivation until I got close to the river. After leaving the lake the path continued through fine forest country, with large open glades of good grass.

The appearance of the country improved greatly as I advanced, and I now came upon several clearings, whilst many cross-roads showed that villages were becoming numerous.

One of the Wakamba whom I met told me that there was another small lake a little way off the path. After a while, I came upon a large Wakamba village, called Singwaia, well protected by a strong palisade, and situated close to the Sabaki, which here made a sweeping curve, and with its dark green fringe of forest made a charming picture. From some rising ground I could see that the country for a considerable distance was open and flat, so I decided to halt here, placing sentries ahead and beyond the village, and pitching my camp inside the forest, so as not to be seen. I remained here, keeping a sharp look-out, from the 17th to the 21st of October. I was close to the Wakamba village of Singwaia, and a short description of this tribe may be given here.

The Wakamba tribe inhabit the north bank of the Sabaki, their chief village being Singwaia, where their principal headman, by name Kalamo, resides. The Wakamba are a branch of the Wanika group, though their language is dissimilar.



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They are, like the Giryama, a peaceful and agricultural tribe, and I was much pleased with those that I met and had any dealings with. There were, I understood, frequent disputes between the Wakamba and the Wa-Giryama, the former objecting to the latter crossing and settling on the north side of the river, which they considered their own ground. Besides the Wakamba villages, there were a few occupied by the Wakahoma and Wachoni tribes.

Late in the evening of the first day, a Wakamba volunteered the information that there was another road to Makongeni, and that the one I was on had been abandoned on account of the flooding of the Sabaki in the rainy season. I found that the road he spoke of branched off a little way below my camp. I gave a reward to the Wakamba for his information, and put a guard on the road at once.

There was a good deal of native cultivation round here, Indian corn, beans, tomatoes, tobacco, etc. Fowls also are very plentiful and cheap, about ten pice each. Singwaia was about two hours' distance from Jelori.

I spent these two days in examining the paths and keeping my outposts on the alert. On the evening of the 20th, my cook came to me with a doleful report of destitution: the cooking oil was finished, only a little oil for the lantern was left, there was no sugar, and though there was flour, no toddy was available to leaven it, and I was therefore without bread, such as it was! In this extremity I sent to Jelori for relief. The Hoopers were in great straits themselves, but most kindly sent me a supply of sugar: fowls and maize were plentiful, so I was not to be pitied. I had discovered two fords over the Sabaki, one just opposite Jelori, the other close to the village of Singwaia. As nothing could be seen or heard of the slave caravan on either side of the river, I resolved to move further up.

At first the path led through forest with a black and sticky clay soil, rendered extremely slippery by the rain which had been falling all the morning and continued falling all day.

Eventually we emerged upon a lovely fertile country, evidently all forest at one time, and now extensively cultivated, the path completely overgrown with high grass fully 6 to 7 feet high, through which it was extremely difficult to

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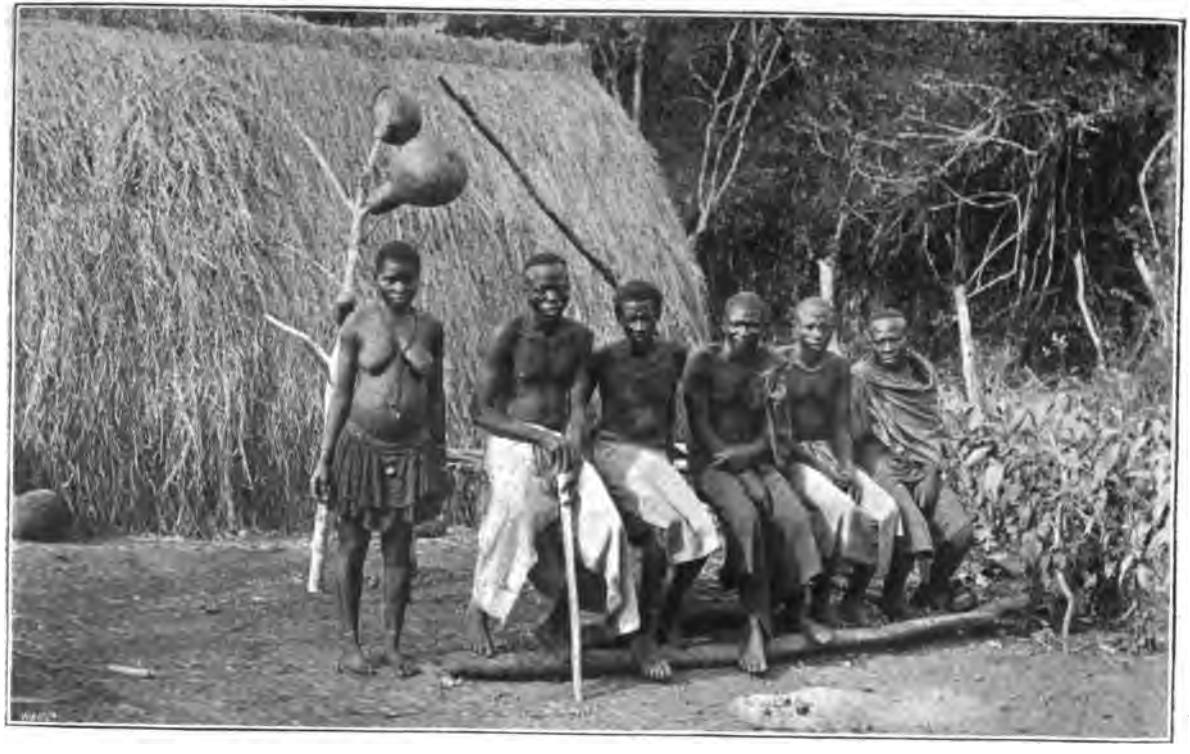

WAKAMBA—NORTH BANK OF THE SABAKI.

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struggle. So many paths branched off to the different fields and villages, that we continually lost our way; indeed shortly afterwards my two scouts came back to report that the path ended at the river, at another ford, the third we had met with —the new path we then followed also ended abruptly at the river, as did the next likewise.

With so many of the Makongeni villages on the north side of the river, I thought there must be a direct route to them from this direction, and accordingly retraced my steps with a view to finding it. After half-an-hour, I struck a path which led to the foot of a very steep, slippery bank, up which we climbed, and found at the top that we had come upon a small runaway-slave settlement; its site was well chosen, for the high bank on which it was situated commanded an extensive view of the country round.

The Watoro here assured me that there was no road to Makongeni on this northern side of the river, and that the country ahead was all thick forest with scattered Galla villages. Wishing to verify this statement, I got one of the Watoro to guide me and two armed porters to the nearest Giryama village, where the head-man confirmed the above statement, saying that the road from Mombrui crossed the Sabaki opposite the village of Arbagundi, and that there was no other road except the one I had just left, and the old war-paths of the Gallas—known only to themselves. We therefore returned to the river, and waded across to the large village of Arbagundi on the south side, which is inhabited by the Wa-Giryama and Gallas. This village and the country surrounding it take their name from Arbagundi lake, which, it is said, partly dries up in the hot season; the soil is of a friable black loam, and very porous, having quite absorbed the heavy rain-fall. Further on it changed to a bright red loam, the grass being short and good.

I had only brought a couple of men with me, having told my porters to wait on the other side till I had found out something definite about the path. I now sent one of the men for the rest of my people, and had my tent pitched close to the river to command the crossing. It had been raining hard all the morning, and all my things—tent, bed, and bedding—

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were wet through; even my writing-board had been washed to pieces in the rain. It was 2 p.m. when I camped, and it was only after a long time and by sheltering it with my indiarubber sheet that my cook managed to light a fire at all. We partook of our first meal that day at 3 p.m., I sitting on the edge of my wet bed, my canvas chair being soaked through. The natives collected in such crowds to watch the white man eat (I was the first they had seen), that I had finally to withdraw from observation by shutting up my tent. The head-men came to see me, but after ascertaining that no caravan had yet passed that way, I told them to come back early next morning. This was by far the worst day and night I had ever experienced; it never ceased to pour. I got my blanket fairly dried at the fire, and wrapping it round me managed to sleep. I lent my rubber sheet to Ramazan to put on the top of his grass-hut to keep out the torrents of rain; the men on night duty had built shelter-huts for themselves, and the remainder had found a deserted one to sleep in.

I had now been seven days on the north bank of the Sabaki and had had ample opportunities of observation. I may say that, on the whole, that part struck me as being most fertile, and well adapted for the cultivation of most tropical products, the loamy black soil found near the river appearing particularly well adapted to the requirements of the cotton plant; and I saw no reason why the cultivation of the Egyptian variety should not prove a success, all it requires being an alluvial soil, a regular supply of water to the roots, and sunshine to ripen the pods.

The country south of Jelori may be described as gently undulating to flat, chiefly forest land, with occasional open glades, and little or no cultivation beyond the river-banks. From Jelori to opposite Arbagundi the country was well populated, flat and open, and very fertile. Beyond this it was reported to be either forest or thick bush, with scattered Galla villages.

I estimated the distance from Arbagundi, where I was camped, to Mombrui, to be between thirty and forty miles, whilst Makongeni was said to be fifteen or sixteen miles off.

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VILLAGE GATEWAY—NORTH BANK OF THE SABAKI.

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Next morning the weather was threatening, but cleared up after a little; I was indeed thankful for the sunshine to dry all my saturated things. All the head-men arrived early, bringing some scraggy fowls as a present. They appeared to think that all Europeans are born doctors, and wanted medicines for various ailments. Some of their demands were remarkable for their touching faith and simplicity, as for instance, medicines to make old people young again, and particularly for some that would make them fathers of many children! They told me that one of the two paths led from here to Anstruther's road (from Jelori to Makongeni), and that the other branched off to M'Lengo-Baya and into the interior. They assured me that there was no road to Makongeni on the north side of the river; so I posted two of my men on the path three and a half miles away, where it joined Anstruther's road, and two more on the path branching off to M'Lengo-Baya; a third outpost of four men I placed outside the village, and felt that I had done all I could for the present.

In the evening the Galla head-men brought a number of fresh applicants for medicine. This hankering for drugs is astonishing; everywhere I went it was the same thing; but I always encouraged the people to come and talk to me, as I found it was one of the best ways to obtain information about their country and themselves.

Formerly the Gallas lived chiefly on a flesh diet, like the Masai, but now maize is their principal food; they are also very fond of goats'-milk, and keep large herds of them, but they told me that they lost a good many by crocodiles seizing them while drinking at the river. The next day, October 26, I was once more restored to comparative plenty by the return of the two messengers that I had sent down to the coast for much-needed supplies; they also brought me a couple of books from Anstruther. They *were* a treat! The messengers also brought me a letter from the Administrator, authorizing me to act as I thought best. Mr. Wilson had also written to me to say that he had got sixty to seventy Watoro scouts watching the country all round Makongeni. The runaway slaves naturally hated the Arabs, and vowed

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to do their very best to catch the caravan, so I thought that I could not do better than await events where I was, particularly as I commanded the sole outlet to Mombrui on this side.

The great drawback to comfort was that as soon as it became dark, I was visited by the fourth plague of Egypt; swarms of insects of all kinds, with remarkably sharp stings, attracted by my light, invaded my tent, fell into my food, plate, and everything, compelling me to beat a hurried retreat under my mosquito-curtains, where a good many managed to follow me. These flies were a great nuisance, for I could neither read, write, nor even eat in peace. Next day there was still no news of the slave caravan, so I set off with one of my men to find a lake which I had been told was close to the village. I found it in a hollow, only ten minutes' walk away; it was small, but evidently became larger in the wet season, and was, I expect, the birthplace of many of my nightly tormentors. A guide I had picked up in the village told me that there were both crocodiles and hippo in a lake further on, so I set off to find it. Passing through some open country, and descending a low valley, I came upon a small lake partly surrounded by cultivation, and I thought it was the one I was in search of; but my guide said no, there were crocodiles here, but his lake was further on. Proceeding through high grass and stunted bush, to my surprise we suddenly came upon a third small lake, surrounded and hidden by high grass; it was simply swarming with crocodiles. Some, of an enormous size, were sleeping on the banks—horrid yellow-looking brutes, with their mouths wide open. Unfortunately, I had no gun with me, and the trigger of my porter's gun was rusty from the recent rains, and would not work, or I could easily have shot several. The hippo lake was still ahead; when found, it was a small and winding sheet of water with hippo tracks all around. As it was now getting dark, I determined, if I could manage it, to return another day and try my luck. From rising ground close by I had a good view of the valley I had just traversed; it appeared a large hollow or basin, surrounded on all sides by forest. The guide assured me that the entire hollow was

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filled with water in the rains and formed an extensive lake, which in the dry season narrowed down to the chain of lakes I had passed.

Para rubber trees would do well here, as the low flooded land and rich soil meet their requirements. On my way back, at the second lake, I succeeded in getting a shot with the porter's rifle at a large crocodile that was basking on the bank about 50 yards away. I hit him, and he rushed back into the water with a tremendous plunge, kicking up a thick shower of mud.

In the evening I received a letter from Mr. Wilson asking me to meet him the following evening at M'Lengo-Baya on his way down to the coast; so early next morning I set off at daylight with the Giryama guide to the hippo lake. On reaching it I at first saw nothing, but presently I observed two pairs of nostrils out in the centre, just above the water. After waiting for a long time, in hopes of a better chance, I fired at the nearest, but the mark was too small and the hippo ducked before the bullet reached. A number of Giryamas that had turned up, told me that sunset was the time to get them, as they then showed their heads well out of the water. The Giryamas were very eager for me to shoot one, for they are very fond of the flesh. I promised them I would return some evening if possible. On my way back I shot two crocodiles; this small lake was simply seething with the brutes, which were swimming about in every direction. Each time that I passed backwards and forwards in visiting these lakes, I was more and more struck with the richness of the pure alluvial soil.

I had just arranged to start for M'Lengo-Baya in the evening when Wilson arrived at my camp. Having heard that I was quite near, he had come on. We spent a pleasant evening together discussing our arrangements, and wondering what had become of the slave caravan, as we could hear nothing of it. Wilson was afraid that it had escaped us by taking a more northerly route.

After dinner we had a little excitement to vary the monotony of camp life. We saw a big glare, and were told that the village was on fire. We rushed off to help with our people, most of these intelligent beings taking their guns with

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them; what they intended to do with their weapons at a fire was not very clear! We found on arriving that the central hut of the village was burning, and if not checked, the fire would quickly spread to all the others, and yet the Gallas and Giryamas stood looking helplessly on. My old Indian experience came to my aid, and I made all our people cut off branches of trees and beat out the fire with them, and by these means we soon had it isolated. Indeed, we had not come a moment too soon to save the village from destruction, in which case, along with all their goods, the people would have lost all their goats, for they are kept inside the village at night in sheds. The Gallas were very grateful for our aid.

The fire was caused by two large black snakes that had come into the village after fowls. A Galla, hearing a fowl in distress, went out with a fire-stick to see what was the matter, and so set fire to the hut. One of the snakes, a large black one, fully 6 feet long, flat-headed and very poisonous, was burnt to death, the other escaped. The heat of the fire was so intense that I was completely wet through with perspiration.

Mr. Wilson left for Melindi next morning. After breakfast, as some Galla boys were taking their goats down to the river to drink, one of them called out that he saw a snake in the tree just above my tent. On looking up, I saw, not one, but two long green snakes ("Mambas" or Tree Cobras, *Dendraspis*), both of which the nakoa Ambari shot.

I went off in the afternoon with the Giryama to the small hippo lake, but the animals showed their noses only above water, and the guide and a boy who was with him made such a row between them that I had to give up the attempt to get a shot. Coming back I had a look at the crocodile lake, and stalking several that were basking on a spit of mud, to the huge delight of the Giryama I sent a Martini-Henry bullet through two of them—one a big brute about 50 yards away shot clean through the body, and the other an equally large one, about two yards beyond him, the one bullet doing for both. The crocodiles stood gasping, opening and shutting their enormous mouths, the blood flowing from the wounds; they

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managed to stagger into the water, rolling into it backwards, belly up.

Next morning I was again unsuccessful after the hippo. They showed only the tips of their noses, and after a couple of hours' useless waiting, I went back to the crocodile lake. Here I met Ramazan and some of my porters who had come to look for the crocodiles that I had shot the day before. It was terribly hard work pushing our way through grass higher than one's head, and the heat was intense. Although we struck the lake in several places—cutting a path to do so—I could not find the spot, and concluded there must be a small island in the centre, on to which the crocodiles had crawled. We disturbed plenty of them, for every time we came near the water, there were two or three big splashes and rustlings in the grass that indicated their presence.

After giving up the search as hopeless, I shot another on the bank, this time with an express bullet which I put into his neck. I had now shot five of them—they are such horrible brutes that one has no feeling of mercy for them!

In the afternoon I received an official letter from Melindi telling me to come down and meet the Administrator, who was expected in a few days. I immediately packed up and started for Jelori, where I was again hospitably received by my friends, Mr. and Mrs. Hooper. Mr. Hooper told me that some Wasania had killed a hippo a few days before with poisoned arrows, and when seen floating on the water thirty-six hours afterwards, it was at first taken for a canoe with two men in it!

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## CHAPTER X

### A THREATENED RAID—MY EXPEDITION TO NO. 2 STOCKADE

A New Commission—Grateful Arab Ladies—Ali bin Jumah—Departure for No. 2 Stockade—The "Siafu" Ant—An Exciting Report—A Hurried Return—Organize a Reconnoitring Party—Native Allies—A False Alarm—A New Start—Oppressive Heat—Centipedes and Scorpions—Troubles with the Watoro—Our Plans—The North-east Rains—March up the Sabaki—Thick Forest—The Sabaki River—Camp in the Bush—Masai War-paths—Difficult Progress—Characteristics of the Country—Game Tracks—Reach the Stockade at last.

ON my way to Melindi I again travelled down by Mr. Weaver's new road, to which several miles had now been added, of a width of 20 feet.

Arriving at the coast I learnt that the reason of my being summoned down was that I was required to go up to No. 2 Stockade on the Sabaki river, this being the second of a series of posts established by Captain Lugard on that route to the interior at intervals of from forty to sixty miles apart. It was to be repaired and victualled in preparation for the Railway Survey party, which the Government was sending to survey the proposed railway line from the coast to the Victoria Nyanza. I at once wired to the Administrator (Mr. E. J. Berkeley, now her Majesty's Commissioner in Uganda), reporting my arrival at Melindi and my efforts to intercept the slave caravan, and received a reply in which I was thanked for my work, and told I had done everything that was possible. The Administrator explained the object for which he desired me to proceed to No. 2 Stockade, and I accepted the mission, pointing out, however, that the work was quite



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outside the scope of my agreement, but that in any matter of urgency I was entirely at his disposal. It was arranged that I should combine the immediate purpose of my present mission with an examination of that part of the country, and report upon its resources and possibilities of development.

For my final instructions I had to await Mr. Berkeley's arrival in the s.s. *Juba*, which was bringing him up from Mombasa.

I found Melindi in a great state of excitement. The day before I returned a Muscat Arab had run amok and shot and killed one of the most influential men in the place, and after wounding another man and woman he was hunted down and shot by the town's-people.

The Liwali of Melindi took advantage of my return to mention the case of Nasur bin Suliman's wife, who had been left by her husband in utter poverty, and he asked that something might be done for her, as she was of a good family. He said he would send her to me in the evening; as custom did not allow her to go out in the daytime, she arrived after dinner escorted by an askari. She was the first Arab lady I had spoken to, and I was struck by her refined features and light complexion. I explained to her that her husband being alive she had no claim whatever upon the Company, but taking her reduced circumstances into consideration, I would allow her a fixed monthly maintenance out of the shamba revenues, which I would arrange to be paid to her every month. The poor woman, whose name was Ayesha binti Sofriani, seemed overwhelmed with gratitude, and seizing my hands kissed them and placed them to her forehead. I gave her a tin of sweet biscuits, and sent her home rejoicing. I told the Liwali next day what I had done, and he was much pleased, and said my action would create a most favourable impression amongst the Arabs.

Another similar case was that of the sister of Suliman bin Abdulla, who appeared to have lent all her money to her brother, and he had left her destitute. I told her I would ask the Liwali to make suitable arrangements for her comfort and well-being, and could not help being touched when I received from her the next morning a thank-offering of a fowl and some eggs.

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Then there was the case of Ali bin Jumah to be investigated. The reader will recollect that this overseer had been suspected of privately selling the Magarini plantations produce.

He was brought down to Mombrui and publicly tried; several witnesses came forward to prove that they had purchased bananas, coco-nuts, etc., from him. He then admitted having sold coco-nuts, excusing himself on the childish plea that "he forgot to tell me," though he had declared, when I questioned him on my return, that he had not yet begun to gather any. He now yielded up an account of $49\frac{1}{2}$ for coco-nuts sold! The man appeared to have been pilfering and stealing wholesale, and he was kept a prisoner whilst efforts were made to recover more of the cash. Another overseer, named Mohamed bin Hussein, and a native of India, was appointed in his place.

I paid a flying visit to Magarini, and was pleased to find a large quantity of cotton gathered, and the young cotton plants looking very well. I took nineteen people from here for my journey to No. 2 Stockade.

When Mr. Berkeley arrived, I received more detailed instructions from him, and learned that my mission was rather a big thing. I had to superintend the reconstruction and victualling of No. 2 Stockade for a large survey party which was shortly expected. It consisted of six European officers, fifty Indians, certain camp-followers, 200 porters, and 120 donkeys; half of which were to proceed by the Sabaki route to my stockade, which had to be victualled and prepared for an estimated force of 150 men for a period of forty days. I obtained the assistance of Mr. Weaver for cutting the road to No. 2 Stockade.

At length all was ready, and I started from Melindi for Jelori on November 4, passing Weaver on the road. I camped near the river and enjoyed a very lively evening, for after dinner an army of "Siafu" (the large red forest ants) invaded my tent, and in a short time I was covered with them. I felt as if I were being nipped with a hundred red-hot pincers. They are awful—they bite you, and then stand on their heads, which they bury into you with a screw-

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like twist. It is impossible to shake them off, they part with their heads and lives first, and have to be picked off one by one! I was obliged to call all hands out to clear the tent, burn fires, and strew hot embers all around. Nothing else would have rid us of them.

The next day proved an eventful one. After calling on Mr. and Mrs. Hooper I had proceeded about two miles, when I was overtaken by a man sent after me by Mr. Hooper, with a note stating that he had information of importance. I returned, and met Mr. Hooper on the road; he informed me of a reported advance of the Witu people to attack Jelori and Melindi. On October 30 letters had been received from him at Melindi to the same effect, stating that he had received information of the threatened invasion from the Giryama people; he was then advised to send his wife and child down to the coast for safety. I severely cross-examined the Giryama chief who brought the news, and what I elicited from him was to the following effect—

A Wasania hunter had told him that the day before, whilst hunting in the forest, he came across the Witu people in great numbers, and that he saw seven different tribes, amongst others the Watiku, the Wa-Katwa, and the Wa-Galla (who were impressed by force), and that it was the people of Witu who had gathered them all together. A good many were armed with guns and the rest with Galla spears. The Wasania was told by one of the Gallas that the chief of the Witu people, Fumo Omari,[1] had told everybody that he was going to make war on the Europeans at Jelori; that he proposed to make friends with the Giryamas, through whose country he would pass; that he would arrive at Jelori early on Sunday morning, and then push on hard for Melindi. The Wasania informant had returned to watch them.

I rewarded the Giryama head-man, and immediately sent a warning to the coast and to Weaver. Mr. Burt now arrived, having heard the intelligence from other quarters. I strongly

[1] Fumo Omari was deposed and outlawed by the punitive expedition sent to Witu by her Majesty's Government in October 1890, to avenge the murder of certain German subjects, but he still had a considerable and lawless following.



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urged Mr. and Mrs. Hooper and Mr. Burt to come in to Melindi, to which they agreed. The former were naturally greatly excited, and hurriedly packing up their things. What they could not carry, I advised Mr. Burt, who remained behind, to send over to the island in the middle of the lake by canoe and then sink the canoe. This he promised to do before leaving the next day. I had a scratch breakfast with the Hoopers at one o'clock; at four Ramazan arrived with the porters who had gone on ahead, and whom I had recalled. They did not relish the prospect of going back to Melindi that night, but they obeyed. I must say the Mission converts behaved badly, and I had to give up nine of my people to help to carry Mrs. Hooper and their baggage, and thus had to leave five of my loads, tent, etc., behind me. I was going to leave my bed also, but my excellent Ramazan, though he left his own pillow, would not suffer me to go without it.

Finally we left at 5 p.m., all Mrs. Hooper's native Christian girls coming with us—the men and women fled into the forest. As it got dark I went on ahead, leaving Mr. and Mrs. Hooper to follow, one of their people carrying the baby. I left them in charge of Ramazan. I hope never to have another experience like that night. It was so dark in the forest that I ran repeatedly against trees, and when I got into the new road it was worse, for Weaver had set fire to a number of felled trees, and getting over them was most difficult. Further on, it was so dark that I could not see the winding track, so I climbed over pile after pile of timber stacked ready for burning, and had so many "croppers" that it was a wonder I did not break all my bones. My porters too had a lively time of it. As I got near Weaver's camp, I fired two shots as a signal of my approach. Just as I arrived I was challenged by a voice demanding (in broken English as I fancied), "Who goes there?" I thought it was one of Weaver's people and did not reply. Challenged a second time, I answered carelessly, "*Bwana.*" To my astonishment, Weaver himself exclaimed, "By Jove! it was lucky you replied, for I had you covered with my revolver, and if you had not answered I should have fired!" It was he who had challenged me, for my two shots had startled him considerably, for after my note

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of warning he thought it was the Witu force, and had turned out all his people ready to fight.

I explained how it was, and got him to send out some hot tea and milk for Mrs. Hooper and the baby. When they arrived Mrs. Hooper declared she could not have gone a step further when the tea met her. Weaver most kindly turned out of his tent for them, and he and I slept in a small one. It rained hard all night.

Next morning Mr. Hooper was naturally anxious to get his wife and child into Melindi, so I left more of my loads behind and put four of my best men to carry Mrs. Hooper and her baby in a hammock, and sent them off at once. It was literally raining in torrents, but Weaver rigged up a waterproof sheet over Mrs. Hooper's hammock, which effectually protected her and the baby from the rain. I followed (telling Weaver to wait for further instructions), and catching the party up, promised the bearers a present if they came on sharp. I then went on ahead to Melindi, meeting some porters with twelve guns, who were sent to our aid by Wilson, still in charge in Mr. Anstruther's absence. A letter from him also informed me that the Acting Administrator at Mombasa had made arrangements for sending a gunboat from Zanzibar. Warning had also been sent up to the Administrator at Lamu.

As Wilson could organize and defend Melindi—where the people mustered a good many guns and were willing and ready to fight—I volunteered to lead a small force back to Jelori to defend the Mission settlement if possible, also thinking that an advanced outpost would be useful to find out the whereabouts of the enemy, and to give timely warning of their approach. This being approved of, I got together about fifty men, consisting mainly of my own people from Magarini, and prepared to start again next morning. Wilson gave me sixteen donkeys to carry up our stores and supply of ammunition, etc. I sent word to Weaver that he was to accompany me, and asked him to keep my loads until I came up. Mr. and Mrs. Hooper were now living in Mr. Anstruther's house.

In the afternoon a letter came in from Weaver reporting heavy firing in the direction of Magarini shambas.

Next (November 7) morning, when I mustered my people, I

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had, as I said, about fifty. I gave out thirty-two Remingtons and two Sniders, and for the rest, Enfield muzzle-loaders, and served each man with twenty rounds of amunition. I was much pleased with the readiness and zeal shown by the Magarini people, who had marched down in the night. We got to Weaver's camp about one o'clock, and found Mr. Burt there. Here I heard that the Witu people were supposed to be at Merikano, only about three hours from Jelori, and that messengers were passing down to the Liwali of Takaungu.

We pushed on in the afternoon, sending two askaris ahead with a Swahili letter to the Mission catechist at Jelori to say we were coming, and telling him to summon all the Giryama chiefs to meet us. Weaver, going on ahead with the vanguard, got a start when he came upon an old camp below Sekoki Hill full of armed men; they turned out however to be the Wa-Giryama who had come to meet us with the catechist. They were all ready for war with naked arrows in their hands, and said their chiefs would come next day for a big shauri.

We at once set all our people to strengthen the boma, as, if the report were correct, the Witu force would attack Jelori in the morning. Weaver and I arranged that one of us should always be on the alert, night and day, and we divided the twenty-four hours into watches. The outposts, one ahead and one behind, were visited every hour day and night, eight men being placed at each during the day and sixteen at night.

Having made the boma secure, we cleared away all bush and trees as far as the river, of which we now had a view. It became dreadfully hot inside the boma, as the high fence all round excluded every breeze, and our tents were so like an oven in temperature that we had to throw water over the smaller one to keep the inside cool, being afraid lest the ammunition stored there should get over-heated.

On the 10th I was very busy making shauri and alliances with the Wa-Kamba, and Wa-Giryama. The latter came into camp over 300 strong with their chief, singing their war-songs and afterwards going through their war-dance. The Wa-Kahoma and Wa-Choni tribes also declared themselves ready now and at any time to take up arms for the Company. There was no doubt that the people were in earnest, and all

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THE THREATENED RAID—ON OUR WAY TO JELORI, NEWS ON THE ROAD.

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the villages on both sides of the Sabaki were beating their war-drums.

I had asked for fifteen soldiers to garrison No. 2 Stockade, and fifteen Beluchis now arrived from Mombasa. They made a most timely addition to our force, which now mustered eighty-one guns. Mr. Burt also arrived from Melindi the same day, and in the evening the Wasania head-man returned from a reconnaissance beyond Makongeni, reporting all quiet and no signs of a hostile party anywhere. Weaver astonished them all considerably by exploding dynamite cartridges in the Sabaki and killing no end of fish.

Next day, in the presence of Mr. Burt (who acted as interpreter) and the various chiefs, I held an inquiry into the origin of the report which had caused all this alarm and trouble. I traced its source to some evil-disposed natives, who had given a false alarm, hoping thus to scare Europeans away. With the approval of the native chiefs I arrested the ringleader Ngoa, and sent him down to the coast to be tried.

As soon as the strain was over, Weaver and I proceeded straight to bed the moment dinner was over, and went off into a dead sleep. Next morning I received a letter recalling me to Melindi. I started at once, leaving Weaver at the camp, and arrived there at 5 p.m., meeting Mr. and Mrs. Hooper, who were returning once more to Jelori. I was very busy for the next day or two preparing for my original expedition to the stockade, and at length started on November 16 with thirty-eight people, including the fifteen Beluchi askaris. The heat during the march was excessive. When I reached a shamba where I was to await Weaver's arrival for breakfast, how glad I was to get some coco-nuts! the last I should taste for some time. Ramazan had been drinking too much eau-de-cologne at Melindi, the Company having prohibited the importation of spirituous liquors, and he simply collapsed in the heat from the effects of his dissipation, and could hardly crawl along. After a long wait, Weaver at last turned up; he had been having an awful time with his people, a lot of them being drunk with the native coco-nut toddy, and a good many more had deserted. I left him a couple of my askaris to hunt up his absentees, and got to Jelori at dusk, where I had to put up my tent myself, as

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Ramazan was miles behind. Weaver turned up just as I was sitting down to dinner. Next morning I left him here with about thirty men to clear the road from Jelori to Makongeni, and pushed on in advance with my porters.

The next stage of the journey—to M'Lengo-Baya—was very hot and trying; we reached it about 12.30 p.m. On arriving at Makongeni, I sent for the Watoro head-men and explained the object of my journey, saying that the Company expected the Watoro to help in supplying porters. They said that most of their people were now away in the Wa-Giryama country and in Fuladoyo, but I succeeded in obtaining thirty-five men, and told them to try and get more.

On moving my tent to another site I discovered, underneath my bed, a centipede and two scorpions—the latter of a light yellow colour.

There was a good deal to be done in sending to and fro to bring up all the loads I was taking to the stockade, many journeys being necessary, owing to insufficiency of porters. I was also purchasing extensive supplies at Makongeni, and had to build a shed to store them in.

I had a great deal of trouble with the Watoro. In the first place as to wages, they deferred agreeing on the matter until the men already engaged—the thirty-five referred to above—came back from Jelori. The next development was that none came at all. I sent repeated messages, and one answer was that the head-man, M'Soma, had kept the wages I had already paid. I was resolved to have it out with them once for all, and summoned all the head-men and the other people to attend. They then apologized for not sending men before, saying their people were afraid to go. I told them I was tired of excuses, and asked them bluntly, would they give the people or would they not? They answered that they were the Company's people. I said, if so, they should show it by supplying the help required. If not, I added, I would leave at once, and let them beware, for now that the road to No. 2 Stockade was being opened, the Arabs would soon be passing up and down, and if they refused men they could not look to the Company for further friendship.

This hint had the desired effect. They promised to give

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me the men, and I told them to do so at once. They sent messengers to the head-men of a big village who had a number of men; but another day elapsed before I could get any definite number, and then they sent me twenty. I agreed to give them fourteen rupees a month, the regular porter rate, but I told M'Soma that until all the promised men turned up I should take him with me as a hostage. The head-man begged me to let him remain to go round to the different villages and hunt up porters, but I declined. However, if I had not been able to get all the men I wanted, I had managed to buy a plentiful supply of food for the use of the Swahili porters coming up with the Railway Surveyors. My camp had become a regular market for the sale of "unga," as maize-flour is called, and the Watoro were in high glee at doing such a brisk trade. M'Soma told me that when the road was cut to the stockade there would be no trouble in getting any number of men. I hoped it would be so!

Weaver arrived on the last day of my stay at Makongeni, having cleared the road so far. Our arrangements were now for me to push on again with all the men I could get, taking with me as many loads as possible, and after getting the stockade repaired and sheds erected for storing the supplies, to return to Makongeni; Weaver meanwhile pushing on with the road as rapidly as he could. When this was completed we were to combine all our men and carry up the remainder of the loads as quickly as possible.

At 11 a.m., on November 26, I started from Makongeni, taking M'Soma and two other head-men with me. We halted for the night by the Sabaki in my old camping-ground.

Early the next morning Aziz, the native officer in command of the Beluchi soldiers, rejoined me with nine more Watoro, making up my number to twenty-nine, including the two head-men. We started off along the same path that I had followed on my first visit, but a wonderful change had now taken place in the appearance of the country owing to the copious north-east rains. Where all before was burnt and dried up, there was now beautiful green grass.

The path over the grass plains and open country, though much overgrown, was visible enough, but through the bush it

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was very difficult to find. Heavy clouds had been gathering overhead, and presently a violent thunderstorm burst with a heavy downpour of rain, and shortly afterwards we managed to miss the path in the very same place where I got lost last time. I went off with a few men in one direction to look for it, but after awhile we were recalled by a shout that the others had found it, so I followed the porters over a faint track leading nearly north, through thick thorny bush, which at last developed into heavy forest with fine trees thickly hung with creepers.

After a time I came upon my people already camped, with fires lit, and my tent pitched. I had intended going further, but the Watoro porters evidently thought they had come far enough.

This was the thickest forest I had yet seen; the trees completely hid the sky, and were matted everywhere with gigantic creepers. We were right on the Sabaki again, and I went down to look at the river, which was here fairly straight up and down, a full muddy stream, with grass and forest on both sides, and good soil.

Next morning, on resuming the march, we found the road so impassably overgrown that it became a case of literally hacking our way through the bush. Our only guidance being old cuts on the trees made by previous caravans passing through this heavy bush, it was necessary to constantly search out our way, and several times we were brought to a standstill for a considerable period. The path at first followed the Sabaki, now very full with yellow water, the banks being low and sandy, and at intervals showing a good deal of stone. The banks were generally bordered with tall reedy grass, with a background of heavy forest and dense undergrowth, followed by thick thorny bush with a good deal of cactus and aloe. About eleven o'clock we lost the road altogether in the dense undergrowth close to the river, and after halting for breakfast we pushed on again, myself, as well as the others, cutting the path before us. Leaving the river we followed the track of a path through the same difficulties, and then, after passing through some open country and rising ground, whilst looking among the scrub and cactus for the road, I caught a glimpse

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to the west of a solitary and comparatively high peak. We next struck through a large flat grass plain, which appeared, from the numerous water-holes, to be submerged during the wet season. We had great difficulty in finding the path on the other side, the numerous game-tracks making it doubly difficult to distinguish it. At last we struck the Sabaki again at a narrower part where it had a more rapid current. There was a bank of stone on the south side, and on the north a fringe of high timber trees. I noticed that Hyphæne, or dum palms, generally grew near the river, and we had also passed a great deal of cactus and thorny creeper. As it was now getting late we camped here for the night, keeping big fires alight to scare the lions.

Next day we had to face the same ordeal of cutting our way through dense bush, containing much cactus and aloe and a great many Hyphæne palms. There were several large open grass glades which made it extremely difficult for us to find the path at the other side. Amongst other discomforts, some of the men were disabled by cactus sap getting into their eyes, which causes great irritation, and blinds one for the time being. The general aspect of the country passed through may be summarized as dense low bush with good soil.

In the afternoon the appearance of the country changed for the worse, the soil became gravelly and stony, with scattered low thorny bush. Here, at short intervals, we passed two Masai war-paths going north towards the Sabaki—the Masai being raiders of cattle, their routes are, as a rule, determined by the supplies of water. I found the heads and skins of two buffaloes killed by lions, and the pieces of skin were appropriated by my porters to make into shoes. I was continually troubled by the Watoro head-men wanting to stop when we struck the Sabaki, protesting that there was no more water for miles and miles ahead! As on the day before, it was again a case of groping our way through the thick thorny bush only guided by a few old knife-cuts in the trees, and our difficulties were much increased by the frequent obliteration of the path by the tracks of buffalo and other large game. Late in the afternoon I obtained a good view

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of the country from some high ground, looking to the north-east. The Sabaki here made an immense curve, and the country, as far as the eye could see, was the same dense low bush, with the same fringe of Hyphæne palms and tall trees on both sides of the river. Later in the day I again descried the solitary hill seen before, and which the Watoro informed me was called *Logi*. I camped again by the river-bank that day, and after being obliged once to get up to quell a fearful row amongst the askaris, the rest of the night was disturbed only by a few howling hyænas.

Next morning, after the usual doctoring of sick porters, we started again through much the same kind of country, which by degrees became more open. We kept close to the river all day. The course of the Sabaki was always distinguishable by its fringe of tall trees—generally tamarinds and Hyphæne palms—the latter being often so numerous as to form groves. This day the Sabaki had been running like a mountain stream over a rocky bed, and in many places the face of the bank on the south side was a regular wall of granite and flint, with the invariable shore of white sand. The water was still very yellow. Whenever the path left the river the character of the vegetation and soil changed at once to sparse and scattered thorny scrub, with sandy or gravelly soil, the country being generally very flat with here and there a slight dip, into which the path descended by a gravelly or stony drop. I passed a great many large patches of slab-rock, and in the afternoon tramped over a good deal of heavy white sand near the river. I saw a good many pieces of quartz lying about, and noticed a tree with a good deal of orchella weed growing upon it. Where we stopped for breakfast under a tamarind tree by the Sabaki—which here ran in two channels forming an island—the ground was solid granite, and indeed the rocky nature of the river-bed just here, as well as of the adjoining land, is very remarkable.

The sixth and concluding day of the march led through very open country, with a good deal of umbrella-shaped mimosa and "n'konge," the same variety of *Sansevieria* aloe. The soil was at first red, and afterwards poor and gravelly with a good deal of quartz. I saw a good many rhinoceros tracks about

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here. The day's journey was generally through flat country, bush, and occasional patches of grass, with a good many black-looking boulders about. The soil was poor and sandy, sometimes improving to brown. Shortly after passing a grass glade one of my men suddenly pointed out the stockade ahead. I fired a few shots to let the weary porters. behind, who had begun to think we should never reach it, know that we had at last arrived—after five and a half days' most fatiguing march through bush and cacti.

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## CHAPTER XI

### AT NO. 2 STOCKADE ON THE SABAKI RIVER

At Work on the Stockade—Climate—The Return Journey—The Sabaki in Flood—Weaver's Road—A Flooded Country—Makongeni again—Damp Quarters—Mosquitoes—Back to the Stockade—Lions—Carrying up the Stores—Meet Mr. Foaker—M'Soma and the Arabs—A Memorable Christmas—Tobacco and Castor-oil Plants—Illness of Weaver—Sabaki Flies—Arrival of the Survey Caravan—Unwonted Luxuries—Runaway Porters—A Long March—An Offer to the Watoro—Giryama Customs—The End of my Expedition.

THE stockade was situated close to the river. It was a small earthwork, and was still in a wonderful state of preservation. I need not enter into the details of putting it into order for the Survey party. The whole thing was completed after seven days' hard work—seventy men being employed at it—sometimes interrupted by rain, or delayed by the difficulty of obtaining grass for thatching the sheds. I built two as storehouses, and a house for the askaris within the stockade, and then proceeded to repair the earthworks and defences generally, so as to render it safe against attacks by Masai raiders. The Watoro, although troublesome in some ways, proved excellent workmen, a fact largely due, I think, to my working amongst them myself. On December 7 all was finished. The two sheds had drains cut round them, with a flooring of strong sticks, to pile the rice makandas upon. The top of the inner bank of the stockade was covered with a thick breastwork of thorn bush 2 feet high. The entire circumference of the stockade was 230 feet outside the ditch; the latter was $4\frac{1}{2}$ feet deep, 5 feet wide at the bottom, and 10 feet at the top, with a sloping earth-bank



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8 feet high above it. The thorn breastwork was carried right round the stockade, and the whole presented a very strong and compact appearance. The Watoro, as I have said, worked capitally, and I never had to say a word to them the whole time I was there; at night, however, they were certainly a nuisance, for if left alone they would go on singing, talking, and shouting to unearthly hours.

During my stay the temperature ranged from 70° to 73° at 6 a.m. (the first morning it was 78° at 5.30 a.m.), from 77° to 84° at 2 p.m., and from 73° to 75° at 6 p.m. There were frequent and heavy thunderstorms with wind and rain, which interrupted our work a good deal.

The country round the stockade was extremely flat, with inferior gravelly soil, umbrella-shaped mimosa trees, and glades of good grass with better soil, and near the Sabaki the invariable fringe of high trees. Although there were tracks of rhinoceros and elephant visible, the absence of all game in this place was remarkable—due, I believe, to the Wasania, of whom I heard there was a settlement at Logi Hill. I only saw one antelope. In the middle of dinner one evening a couple of hippos bellowed quite close to the camp, but we were unable to obtain sight of them.

Everything now being completed, I was ready to return to Makongeni again. I paraded the eight Beluchi askaris, and handed over the charge of the stockade to Aziz, their native officer, leaving him sufficient supplies until my return, and directing him to keep a watchful guard. I started off again with the rest of my people on the morning of December 8.

Soon after leaving, and whilst crossing the large grass glade below the stockade, I came upon six large water-buck, but they were off before we could get a shot. We now came upon numerous tracks of game on the path, for the rains had transformed the whole country into fine rich pasturage. Going was, however, very heavy, as the rain still continued, heavy downpours occurring at frequent intervals throughout the day and night. The Sabaki was in heavy flood, with a tremendous current of thick yellow water, so high that the rocky channels were all submerged. Whilst having breakfast two messengers

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arrived with a letter from Weaver, who had already cut twenty miles of road from Makongeni, with forty people. In the evening I reached our intended camping-place ahead of my people, and had a long wait before they came up. I was again disturbed by a hippo during dinner, but could not find him in the dark.

Next morning we were again in rich country, fine forest land with some green glades and a rich chocolate soil. The country in many places was under water, and through one open glade there was a regular river running. The general appearance everywhere was most luxuriant after the rain. I came upon Weaver and his forty people hard at work on the road at about ten o'clock. He had now done over twenty miles, and I estimated he had twenty-five miles more to cut; when this was done, the supplies could be got up to the stockade from Makongeni in a two days' march. We arranged that when the road was finished, Weaver should build a shed for the reception of stores at the place where I had camped the preceding night, and send his people to carry the loads thence to the stockade.

I left Weaver at about 2 p.m., and waded through a large grass glade flooded to a depth of 3 feet, next passing over a stony rise and some forest, after which the land became flatter, and gradually deeper and deeper under water until it was well up to my middle; and so it continued for a considerable distance. After passing through some heavy forest, I came in the evening upon Weaver's old camp, the huts of which were very welcome to my people, who had spent the night before in the rain. At six o'clock the thermometer was 72°.

On the third day of my return journey to Makongeni the thermometer readings at 6 a.m., 2 p.m., and 6 p.m. were respectively 72°, 85°, and 78°. The weather in the morning appeared to have cleared up. Weaver's road was certainly a great improvement. At first we traversed heavy forest, followed by open glades of rich grass, some very extensive, and all more or less flooded from knee to waist deep, so that we again had to wade. Following the Sabaki, now flowing with a very full and fast current of discoloured water, we

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came upon another flooded grass plain, where the water gradually increased in depth until it reached my neck. I took advantage of being so wet to have a good swim, the first I had been able to enjoy in Africa. Fortunately none of our loads got wet.

I passed some Giryama Indian corn patches, growing in remarkably rich soil. For about twenty miles above Makongeni the country was rich, fine forest and thick undergrowth alternating with open flat glades of good black loamy soil, now covered with luxuriant grass. I reached Makongeni at about 10 a.m., my people firing guns to announce our return.

I remained at Makongeni till the 15th (five days), making arrangements for the conveyance of the stores up to the half-way shed, and buying further provisions. The weather was utterly miserable, the ground a mass of liquid mud from the constant torrents of rain, and my tent was in a veritable quagmire. The mosquitoes, too, were an intolerable nuisance; notwithstanding curtains and fires, they gave me very little rest. They were able to sting through a canvas chair with a newspaper folded upon it!

I had an interview with the principal head-man, M'Soma, whom two days' sojourn in the bush had rendered most amenable, concerning the transport work, and I bluntly told him I was going to have no nonsense this time, as the road was cut now, and the men could carry loads to the half-way shed in one day. However, I found the people willing enough to come forward, and leaving Ramazan in charge at Makongeni with instructions to send two askaris up with each safari (or caravan), and to accompany the last one himself, I started on December 15, with sixty-six porters. As I had no askaris with me, I had a hard task to keep the caravan in proper order; the Watoro were always falling behind to drink or sit down, and just outside Makongeni they all halted for half-an-hour to eat some cooked "unga" their women had prepared for them. We made a detour to avoid the flooded glade, but all the same we had to wade knee-deep through slushy water. The whole of this day we had to tramp through a great deal of water—in one place the road was submerged waist-deep for over a hundred



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yards—and what with the holes and thick mud made by hippos, it was very difficult to keep one's feet. We reached our camping-place, twenty miles from Makongeni, at 5 p.m. During the night I heard two lions roaring on the opposite side of the Sabaki; they were the first I had heard, and certainly on a calm, silent, moonlit night the sound is very awesome.

I had spoken sharply to the head-man about the very indifferent marching of the Watoro the day before, and my words had a good effect, as they stepped out better next day. We got over the remainder of the distance to the half-way camp in four hours.

Here I found Weaver had built a good strong shed, where I piled all the loads, and then sent all the porters, including my own men, back to last night's camp, where they were to sleep that night, starting again for Makongeni next day for fresh loads.

The weather had been very hot, the thermometer readings for the day in the shade being—6 a.m., 70°; 2 p.m., 92°; 6 p.m., 80°.

The roaring of the lions at night frightened my small party of six men so much that I was obliged to keep two big fires burning all night to reassure them.

I remained here, superintending the forwarding of the stores to the stockade, until January 7, 1892 (twenty-four days).

The temperature in the morning during this time was 70 to 76°, afternoon 90° to 97°, and evening 74° to 84°. During my stay I traversed all the country around, which possessed much the same characteristics as that already described, with the addition of a good deal of n'konge aloe.

On December 20, on returning to my camp after one of my excursions, I found that Mr. Foaker, one of the Company's officers, had arrived from Machako's, a station on the Uganda road about 250 miles inland, with a party of twenty-four porters and sixteen askaris. He had left Machako's on November 26, and had been twenty-five days on the road, on his way to join the Railway Survey party. In coming down, Mr. Foaker had had to cut his way through to No. 2 Stockade, the

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path being completely overgrown; it had taken him six days to reach that stockade from the preceding one. Game, especially rhinoceros, he reported as very plentiful, particularly above the junction of the Tzavo with the Sabaki. He once saw six lions feeding on a water-buck; all were maneless, but they bolted when they caught sight of him. There were no buffaloes, the cattle epidemic having killed them all, and numberless skulls lay along the wayside. Once the caravan was scattered by a rhinoceros charge; they had come right upon two, which immediately charged them, compelling Foaker and all his people to scale a bank to escape. One of the rhinos actually chased Foaker along the top; he only escaped by rapidly sliding down again. On the road they met a large party of Wa-Kamba (natives of the country around Machako's) going to Mombasa to sell cattle, and at first thought they were Masai. Two hours before reaching No. 2 Stockade there had been numbers of elephants on the path, ploughing it up.

Another incident was the receipt of news by one of my caravans from Makongeni, that four Arabs had come up there from Melindi, and had gone into every house searching for runaway slaves; but the slaves in question had gone on to Fuladoyo. M'Soma wished to fight the Arabs, but I sent word to him to await my return, when I would inquire into the matter.

Up to the 24th I had received four caravan loads of stores from Makongeni, and on this day the first party of Weaver's porters came down, having completed the road to the stockade, whereupon I began the final work of transporting the loads up to it.

This half-way camp was an awful place for deadly snakes. I had thought the flies bad enough, but they were worse, and the reader will agree with me when I give him one day's experience. This is how I spent Christmas Day.

In the morning, just after I had got up, I saw one going under the mats of my tent, and on lifting them up I found a hole under the head of my bed. Shortly afterwards my servant found another coiled up amongst my boots; it escaped before he could kill it. In the afternoon, whilst I was sitting reading

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in the store shed, which I found cooler than my tent, with a cup of tea on the table by my side, I suddenly heard my spoon jingle, and looking up hastily, I saw a large green "mamba" with its nasty flat head over the tea-cup, its body curled round my chair and table. I gave an involuntary jump, the snake turned rapidly towards me with a hiss; I remained stock still, then to my intense relief it slowly uncoiled and glided away. I am not ashamed to say I was in a ghastly funk, and felt quite unnerved for the moment. Half-an-hour afterwards I heard a rustling at my feet, and looking down I saw a yellow-spotted brown snake gliding between my legs; this was too much of a good thing, so I called out to my people, and we had a regular hunt, pulling out every rice-bag and killing several of the brutes.

My cook now came forward, and told me that he had an infallible remedy for preventing any more snakes coming in—might he practise it? I said by all means, and waited with much curiosity to see what he would do, but lo and behold! the infallible remedy merely consisted in sticking pieces of lighted cotton cloth at intervals round the camp!

Before I left this "half-way shed" I saw another kind of snake quite new to me coiled on some rocks on the river-bank; it was of a dark red colour and about 3 feet long, and from its flat head evidently poisonous.

One day I discovered a few tobacco-plants growing in a fine grass glade a short distance from camp, which, I concluded, had sprung from the seeds of tobacco originally planted by the Wasania in an abandoned shamba near here. That the tobacco, which was most healthy, should have withstood neglect and the growth of grass and bush around it, said much for the adaptability of the soil for its cultivation. Near the same place I also found one or two old castor-oil patches, some of them growing in the river-bed itself, and looking extremely healthy. It was on this same morning that I was awakened by a tremendous uproar on the other side of the river; it was caused by an unfortunate baboon that had been seized by a leopard, which was dragging it, in spite of its struggles, into the bush.

During the last few days I had been greatly worried about

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A DEAD BABOON.

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Weaver, who was up at the stockade; he had been suffering for some time from dysentery and severe attacks of fever; I had repeatedly written to him urging him to return to the coast, but he always wrote back that he would not budge until the last load had been delivered at the stockade. However, he got so bad, that when the last loads from Makongeni arrived at my camp he, to my great relief, at last consented to leave for Melindi. Poor fellow, he looked so dreadfully worn and ill when he arrived that I really feared he would never reach Melindi alive; he had had a trying time at the stockade, and had been badly bitten by some horrid species of horse-fly, which infests the Sabaki, and which, whilst inflicting a painful sting, at the same time deposits an egg in the flesh. This eventually turns into a maggot and causes a painful sore. Weaver's dog Fan was attacked to such an extent by these flies that it had to be shot.

I felt very much being compelled to send him off alone in such a state, but I could not desert my post until relieved; however, I tried to do all I could for him, and as he was too weak to walk, I rigged up a sort of hammock out of empty rice-bags and then bade him good-bye. He had a very good servant, who promised me faithfully to do his best for him. I am glad to say he got down safely, though he had a terrible journey, being nearly drowned on the way when carried through the flooded country. He rather alarmed the officers of the Survey caravan, who, as they told me afterwards, wondered in what state they would find me!

On January 7, 1892, two days after Weaver had left me, I started off again for No. 2 Stockade with the last loads, where, having made an inventory of all the stores, I handed the charge of them over to Aziz and his askaris until the arrival of the Survey party. They arrived next day under the command of Captain (now Major) Macdonald, accompanied by Lieutenant Twining, both of the Royal Engineers, together with a caravan of stores for Kibwezi under a leader named Ayubu.

If this ever happens to meet Captain Macdonald's eye, I hope he will again accept my cordial thanks for the champagne which he produced at dinner from his limited

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supply of medical comforts. I remember it now, and how good it tasted! We had some tea in the evening, which I thought delicious, and Captain Macdonald kindly gave me a packet, remarking that it seemed to him of only ordinary quality which he had bought in Mombasa.

I discovered next morning that my own tea tasted particularly nasty, and on looking at my store I found that it must have got soaked through in one of our wading expeditions, as it was now reduced to a pulpy mass. No wonder that fresh tea tasted good after drinking this decoction for days!

With the coming of the Survey party my duties up here were at an end, so wishing them a safe and prosperous journey to Uganda, I was not sorry to bid good-bye to the stockade. I started on my way back the same morning, reaching the half-way camp in the evening.

As I was sitting outside my tent after dinner, I was surprised by the arrival of twenty-two porters from Ayubu's caravan. I was very nearly arresting them, as they had no letter from Captain Macdonald, but they told me that they had been sent down for some loads of food left by Ayubu at Makongeni. Believing what they said, I let them pass. But next day a head-man of Ayubu's, who had been sent down to bring in nine porters that had bolted, informed me that the twenty-two porters of yesterday were runaways. Shortly afterwards thirty-eight more arrived, and on being challenged, said they were going back to Takaungu, as they were only engaged to carry loads up to No. 2 Stockade. I said they should not pass, and that I would take them back to the stockade, and I put some of my people to guard the road below; but the runaways broke away like so many rabbits, running into the bush in every direction, and so got off. I at once despatched a messenger to Makongeni to warn M'Soma to stop them. Then six more arrived; I took their guns from them, and handed them and their guns over to Ayubu's head-man. This made sixty-six runaways in all.

Makongeni was fully thirty miles away, but I told my people we must get there that day, and notwithstanding the heat and the still flooded state of the road, they did exceedingly well. I reached my old camping-ground at 7.30 in the

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evening, very tired after the hot thirty miles' march. I at once told M'Soma to put men on the road to stop and catch the runaways, and immediately sent off a messenger to report the matter to the Liwali of Takaungu.

The following morning, after paying off all my Watoro porters, and handing to each the full amount he had earned, I summoned M'Soma and all the principal head-men to a grand shauri in the afternoon.

I reminded them of all I had said to them the first time I had come to visit their country, and then told them that I had since been in correspondence with the Administrator at Mombasa, and that I was now empowered by the Company to offer them the following terms—

1. Their former owners had agreed to accept fifteen dollars in full payment of their freedom.

2. For those who could not at once pay the money, if willing to accept these terms, work and wages would be found by the Company.

I dwelt at length on the advantages which the Company's offer placed within their reach, of living in freedom without the dread of recapture hanging over their heads, and pointing out all it meant to them by the opening up of the Sabaki district, and said that I hoped my proposed plantation at Jelori would be the first step towards this new and free life, and that peace and prosperity was now beginning for all. What did they say? I added that I was prepared to open a list at once in which all who accepted the Company's offer could register their names, giving at the same time their master's name, to whom the redemption money would have to be paid.

The head-men listened most attentively, and after a discussion amongst themselves, M'Soma informed me that they accepted my proposals with gratitude, referring especially to what I had said concerning the proposed plantation at Jelori; they all promised to come in to have their names registered, but the people living on the north bank would have to wait till the river, still in high flood, was fordable.

I was very busy throughout the following day, and by the evening had written down the names of over one hundred and

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thirty people. I found them most ignorant as to time and dates, circumstances of which they appeared to have the vaguest notions. The answer to the question, when they ran away, was either "I don't know," or "A long time ago."

I heard that evening that fifteen more of Captain Macdonald's runaway porters had been caught by Salim bin Hamisi's men; shortly afterwards Ayubu the head-man arrived from the stockade, having only seven men left. He was going down to Takaungu to arrange about new porters.

Heavy rains still continued, and the Sabaki was higher than ever, so, as my work here was over, and I was anxious to get back to Magarini, I told M'Soma that I would arrange with Mr. Hooper at Jelori to register the names of the people living on the north bank, who must go down to him for this purpose. On my way to the coast I was again the recipient of much kindness and hospitality from the Hoopers. I had brought M'Soma down to the coast with me to receive a well-earned reward for all his endeavours, for latterly he had done very well indeed.

Whilst at Jelori Mr. Hooper gave me some interesting information concerning the Wa-Giryama people; it appeared to be their custom, whenever a child was born feet foremost, for it to be handed over to the "medicine man," who took it to the forest, leaving it to die there. The same thing happened if a child's front teeth grew before its lower ones; this is considered most unlucky, and this child is also cast away to die; they don't kill them, but leave the poor unfortunates either to die of starvation and exposure, or to be eaten by wild animals. Similar cruel customs prevail amongst many of the other native tribes. Mr. Hooper had already done a great deal to check them, and had also brought the subject before the Administrator.

A Giryama a short while ago had appealed to Mr. Hooper in a case of this kind on behalf of his child. From what I observed and was told by Mr. Hooper, it seemed that the Wa-Giryama would willingly take their various complaints before a European, but they objected to the jurisdiction of the Liwalis, for they argued, "If we have a case against a Swahili are we going to let another Swahili try it?"

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I left for Melindi on January 20. Owing to the heavy floods, the whole of the flat land between the Sabaki and Lake Jelori at the foot of Sekoki Hill was under water, the only means of crossing being the Mission canoe.

How glad we all were to see Melindi and the sea once more after three months in the bush! I was also very glad to find Weaver comfortably established in the Company's house, looking much better, but still very ill. He shortly afterwards left for Mombasa and took a cruise in the s.s. *Juba*, but his system had got so thoroughly weakened that it took him a long time to rally, and it was not until he went to Zanzibar for final treatment and advice, that he quite recovered from the effects of his trip up to No. 2 Stockade.

I only remained in Melindi long enough to settle various matters connected with my late expedition, and then left for Magarini.

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## CHAPTER XII

### SUGGESTIONS FOR THE DEVELOPMENT OF THE COAST LANDS AND SABAKI DISTRICT

Fertility of the Country—The Coast-lands—Declining Cultivation—The Labour Question—Tamul Coolies—Ploughs and Draught Animals—Products—Cotton—Coco-nuts—Bananas—Silk-cotton Trees—Mangrove Timber—The Sabaki as a Water-way—Irrigation—Timber—Indiarubber: the various species—Nutmegs and Cacao—Castor-oil—Fibre-producing Plants (*Sansevierias*)—Prices of Fibres—Ramie Grass—Pineapples.

IN the foregoing chapters I have tried to give as accurate a description as possible of the chief characteristics and qualities of the soil of that typical portion of the country extending from the coast between Takaungu and Melindi, for an average distance of fifty miles into the interior. That the country is, as a whole, exceedingly rich and fertile there can be no possible doubt; in the coast-lands especially we possess an extent of territory which for productiveness and richness of soil it would be difficult to equal, whilst in the extensive forests extending along the banks of the Sabaki there are possibilities of future wealth and prosperity which only require development to be realized.

In dealing with the best method of developing the various resources and capabilities of the country, I shall refer first to the coast-lands, and afterwards to the interior.

The stretch of country lying between Melindi and Takaungu is, in the northern portions, extensively cultivated. There are large coco-nut, mango, and banana plantations, also a considerable amount of open cultivation of seed and oil grains, with a few minor products. But as we



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COCO-NUT TREES IN THE MELINDI DISTRICT.

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proceed southward cultivation decreases, although the quality of the soil is equally rich and fertile, and it is only in the immediate neighbourhood of the towns and villages (which are far from numerous) that cultivated areas are to be found; and this state of things extends down to Takaungu itself. I was particularly struck with the large area of abandoned clearings that I passed through in this part of the country, and by the fact that coco-nuts also decreased in a marked degree, comparatively few plantations being found round Takaungu.

In looking for the causes of this state of things, the solution is easily found in the system of *cultivation by slave labour*. Prior to the advent of the East Africa Company, slavery flourished undisturbed, and it was an easy matter for rich Arabs and Swahilis to cultivate extensive tracts of land, but as slaves became more and more difficult to procure, land naturally went out of cultivation. Thus we find a lessened area of cultivation concurrent with a diminishing slave population. The same fact will, I think, explain the absence of coco-nut plantations in the southern districts; the non-success of this cultivation being, in my opinion, entirely owing to want of care and sufficient labour.

The natives do undoubtedly recognize the present unsatisfactory state of affairs, and would, I think, gladly avail themselves of newer and better methods of agriculture; whilst surely it is one of our first duties, having stopped the slave trade, to show them the way!

As regards future labour, no anxiety need be felt, for the country possesses the foundation of an abundant and useful supply, in the numerous aboriginal tribes inhabiting the borderland between the coast-zone and the immediate interior; for instance, the great agricultural tribes of the Wa-Giryama and Wanika in the Melindi district, whilst to the south are the Wa-Digo, and in the north the numerous Pokohomo tribe on the Tana river, to whom subsequent reference will be made.

At present the wants of these natives are so few and so easily satisfied, that they do not yet realize the benefits to be derived from steady and continuous labour, but much is to

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be hoped from the gradual spread of civilizing influences amongst them, and it is a most hopeful sign that these tribes evince a strong desire to settle wherever Europeans appear.

Moreover, as the country is opened up, and the richness of its soil and adaptability to the growth of the most important tropical products is realized, East Africa will naturally follow the example of Ceylon, Mauritius, Natal and the West Indies, and can look to India for the extra labour she would require. The introduction of foreign labour would prove not only a sensible relief to the poorer and more congested agricultural districts of India, but an immeasurable advantage to the indigenous population, by bringing home to them by example the manifold advantages of steady, peaceful cultivation and labour.

When I was in Africa this prospect was more remote than it is now. I thought then (and it is just as applicable to-day) that as an initial measure the introduction of a small force of about twenty or forty Tamul labourers would be of immense help in developing the agricultural resources of the districts I had examined.

As I suggested at the time in my reports,[1] these might

[1] *Extract from Report:*

MEMORANDUM OF NUMBER OF MEN REQUIRED ON A MODEL FARM, WITH AN ESTIMATE OF PROBABLE RATES OF PAY.

| No. | | Rupees. |
|---|---|---|
| 1 | Overseer in full charge of Indians, at forty rupees, to be increased to fifty rupees in two years ... ... ... | 40 |
| 3 | Skilled men for tobacco-curing (two Factory, one field-work) at twenty rupees ... ... ... ... ... ... | 60 |
| 2 | Trained men from Govt. Agricultural Farm at Saidapet, Madras, at twenty-five rupees ... ... ... ... | 50 |
| 2 | Men for cotton cultivation (cleaning, pressing, etc.) at twenty rupees ... ... ... ... ... ... ... | 40 |
| 10 | Tamuls to assist above, and to include Ediens (cattle-keeping caste), Ryots, and coolies accustomed to plantation work to take charge of nurseries; pay at ten to fifteen rupees. (The ten Tamuls should be induced to bring their families) ... ... ... ... ... ... | 150 |
| 18 | Total monthly ... | 340 |

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include a few from the Dindigul and Trichinopoly districts, with a knowledge of tobacco cultivation and curing; also a few from the Tinnevelly cotton districts, some Ediens (shepherds and cattle-keeping caste), as well as ordinary ryots and coolies accustomed to plantation work. With such people placed upon experimental plantations to show the natives the way, a beginning could be made, and a better mode of cultivation gradually introduced, for on these "model farms" the cultivation of many new products could be carried on and thus introduced amongst the people.

Ploughs are the first requirement. The free friable soil, with its almost total absence of stones, is particularly adapted for their use, and I feel sure that if once the natives realized the great saving of labour effected by them and their general usefulness, they would readily adopt them. The people are willing to learn, and the large proprietors—men of influence and wealth, such as the Liwalis—would be quite willing to lead the way. The kind wanted are the light Indian ryot ploughs.

Next comes the question of draught animals. Donkeys could be utilized for drawing the ploughs until native cattle were trained to the work, and the numbers of these could, with care, be largely increased. The country is rich in grasses, notably the guinea-grass so often referred to in the preceding pages, and in dry weather there is the straw from the rice cultivation, besides a large supply of coco-nut poonac, and cotton-seed. If India, a country inferior in every way to East Africa in respect of pasturage and grasses, and having to contend with many virulent and contagious diseases, and in many districts with a long and trying dry season, has been able to keep up successfully a large cattle supply, the same

I do not consider that more than ten Tamul coolies are required, as Watoro and freed slaves are perfectly able to carry out the rough work of felling, clearing, and opening up forest land. Half of the above Indians to reside at the Experimental Plantations at Jelori and Magarini respectively. The Indians to leave India as free emigrants, and on arrival in this country to *sign a two years' agreement*, at the rate of pay previously agreed upon, and binding themselves to reside wherever the Company desire.



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could be done in Africa under more favourable conditions.[1] Hitherto, cattle have been only esteemed for milking purposes, but let their greater value as draught animals once be appreciated, much more care and attention will be given to them.

Of the products known to be well adapted for cultivation, *Cotton* stands out first in importance, and the *wild* cotton plants scattered about the country attest the extreme suitability of the soil and climate to its growth. I made a commencement in its cultivation at Magarini, where, though but a small area was planted, and this late in the season, the

COTTON STORE SHED—MAGARINI PLANTATIONS.

results were most satisfactory and encouraging. In addition to the suitability of the soil, the cultivation of cotton is admirably adapted to the people, and the Wanika took to it most kindly. The seed is a most useful food for cattle.

[1] *Extract from Report:*

*Stock.*—I am also desirous of making a commencement with a small herd of *Cattle* which I would *stall feed;* and would suggest planting all the mature coco-nut plantations with *Guinea-grass.* I believe with care much could be done to increase the number of cattle on the coast-lands, and the following extract from the *Overland Ceylon Observer* of May 30, 1862, is most interesting as bearing on this subject—

"The first means of preserving a cattle stock in health is full feeding. Epidemic diseases almost always originate among the weak and half-starved; though it may reach the well-fed and healthy by contact, it is less fatal, and spreads less rapidly among these. At one time there was

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SEA ISLAND COTTON PLANTATION—MAGARINI PLANTATIONS.

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I also wish to emphasize the great possibilities that exist for the extended cultivation of *Ground-nuts* (*Arachis hypogæa*), so largely grown on the western side of the continent.

This product is one for which there is always a large and steady demand, and it yields large and immediate returns. In Southern India, it is estimated that the profits on ground-nuts approximate to 150 per cent. on the outlay, or fully four times more than on rice. The soil of the coast-lands is just what is required for its cultivation.

Much could be done in the districts under review to extend the cultivation of *Tobacco*, which should become an important industry; but for this, not only better seed but skilled labour is required.

I now come to the important matter of *Coco-nut cultivation*. Regarding the comparative failure of this cultivation in the southern districts, I would suggest the establishment of an experimental plantation in a suitable position, where the people could be shown that the want of proper care is the sole cause of its failure. The plantation need not be large, but merely sufficient to prove this and to stimulate the renewed cultivation of a most useful and valuable product. That the

almost an annual murrain among the draught bullocks on the Colombo and Kandy road that swept them off in hundreds. For the last seven years such a thing as murrain has scarcely been heard of on the roads, while thousands were taken off in the villages. The cause of this is evident; the large strong coast bullock has superseded the small native breed on the road; as the former are trained from their calfhood to dry strong food, the latter refuse everything but green grass food, and prefer picking it up for themselves. Fresh grass alone does not communicate the stamina to stand hard work even when it can be had in abundance in wet weather, and heavy roads fit them for disease. On the other hand, when food is scarce, an insufficient supply is equally productive of the conditions that produce disease. The owner of a coast bullock cannot afford to starve him, as he costs from £5 to £12, and immediately falls off in condition and in strength unless he gets dry straw, poonac, and kollu, and is regularly rubbed down and washed, and in fact treated with as much care as a valuable horse. The cattle now generally employed on the roads are strong, fine, well-fed and well-tended animals, some of them within my knowledge costing £25 per pair; and while this is the case the occurrence of a serious murrain on the road is among the least probable of possible contingencies."

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coco-nut is well suited to the country, the luxuriance of the cared-for trees and their large yield of nuts amply testify, but, as I have remarked before, the coco-nut will *not* stand neglect; indeed in Ceylon there is a well-known native saying, "A coco-nut will not grow out of the sound of the human voice."

At the time of my visit but little if any use was made of the bye-products of the coco-nut tree. The husks were everywhere thrown aside as useless, and only, I believe, in Lamu, Patta Island, and to a small extent by the Comoro Island people in Zanzibar, is a little coir rope manufactured.

The same remarks apply to *copra*—the dried kernel of the nut yielding the oil of commerce—and to *poonac*, which is the residue left after extracting the oil, and which forms an important and nourishing cattle-food. Neither is the *toddy* used for the manufacture of sugar, as in India.

The coco-nut cultivation in the Melindi district, large as it is, could be greatly extended, especially in the north towards Mombrui and Gongoni, and the increased demand for its various bye-products will doubtlessly bring this about.

The soil, climate, and everything is in its favour, and the tree could be grown by hundreds of thousands along the fertile lands, back-waters, and mangrove swamps of the coast. I am all the more interested in the extension of its cultivation, as I am able to testify from my own experience to what has been accomplished in Southern India in late years, where private enterprise has realized large profits from the various bye-products of this tree. I give some particulars in Appendix B. There is no reason why East Africa should not in the near future be a large exporter of all the bye-products of this useful and profitable palm.

*Coir.*—The manufacture of coir is so easy that if a demand was once created, supplies of it would soon be forthcoming. All that is necessary is to soak the husks in water until sufficiently rotted, when they are taken out and beaten with clubs. This separates the fibre, which is then well cleaned, washed, and dried, and this completes the process. (See Appendix B.)

Before dismissing the question of coco-nut cultivation, there is an important point bearing upon it to which I would

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COCO-NUT GROVE—MAGARINI PLANTATIONS.

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BREAKING COCO-NUTS FOR COPRA—MAGARINI PLANTATIONS.

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specially call attention. Therefore I quote the following extract from Messrs. A. M. and J. Ferguson's valuable work on *Coco-nut Cultivation* concerning the growing of coco-nut trees in brackish mangrove soil—

"The *Penang Gazette* observes—'Coco-nuts growing in mangrove soil on the side of creeks, more or less saturated with salt, have their milk brackish, and the sap from which it is secreted must be saline also. These trees do not suffer

BREAKING COCO-NUTS FOR COPRA.

from the attacks of the rhinoceros beetle. Trees planted in such a situation are found to bear much sooner than those planted on a sandy soil.' As an illustration of this, the *Penang Gazette* states that 'while trees planted as far back as thirty years ago in sandy soil have not yet borne fruit, although they are fine-looking trees, other trees in the same plantation, only ten years old, but planted on low ground, where the sea-tide comes up daily, washes the roots and runs

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off again, are in full bearing, giving from fifty to one hundred nuts yearly. It is true that the milk of the nuts produced by such trees is slightly brackish, but the kernel is as thick as that of coco-nuts grown on sandy soil, and produces as much oil. The chief requisite with regard to a plantation in such a situation is attention to the drainage. Drains should be cut longitudinally between each row of trees, and cross ones at greater intervals. These drains must be left clear, so as to allow the salt water to flow in and out freely. The tide is found to deposit among the trees a very fertilizing matter. If the drains are not attended to and the water stagnates, the trees get dwarfed and become thin towards the top, thereby preventing them from having a large crown.'"

With the large extent of mangrove swamps extending along the British East African sea-board, the importance of the foregoing remarks cannot be emphasized too much. The cultivation of coco-nuts in mangrove swamps would also tend to render the coast-lands more salubrious.

Now that the *Banana* fibre and dried meal are becoming of importance, it would be well worth while, in a country where this plant grows so plentifully, to pay some attention to its systematic cultivation. The most valuable variety is the *Musa textilis*, yielding the Manilla hemp; and judging from its requirements, I am inclined to think Uganda would be the more suitable country for it, for the uncertain rain-fall along the coast is a drawback to its successful cultivation there. The fibres of other varieties of plantains and bananas, though not so valuable as those of the *Textilis*, are of commercial importance, though I am not aware that any valuations have been made upon East African samples.

The *Silk-Cotton* Tree appears well adapted to the country, and grows so rapidly that it would also be well worth while to pay more attention to its cultivation. The cotton sells locally at two dollars a frasila, or about twopence a pound weight!

*Sugar-cane* is cultivated to such a trifling extent that it is unnecessary to make more than a passing reference.

A source of wealth exists too in the useful and valuable mangrove timber, which is much valued for building purposes,

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being proof against the attacks of the destructive white ants. Its bark likewise contains a large proportion of tannin, besides yielding an excellent brown dye.

Speaking of timber-trees leads me to refer again briefly to the *Casuarina* tree—the Australian "she-oak"—which grows plentifully around Marereni. This is not only a valuable fuel tree, but is noted for its wind-resisting qualities, and though preferring sandy soil, will grow anywhere at almost any elevation.

Before entering upon the subject of cultivation in the interior, perhaps it will be of more interest to deal first with that great geographical feature of the country—the *Sabaki river*—its capabilities for navigation, and the nature and commercial value of the forest along its banks. It is obvious, that both in relation to the utilization of the timber and to the absence of roads, the capabilities of such a water-way are of very great importance.

The following barometric determinations made by Mr. Weaver furnish an idea of the gradual and steady rise of the ground from the sea up to No. 2 Stockade—

| | | | | |
|---|---|---|---|---|
| Méré Shamba ... ... ... | 200 | feet | above | sea. |
| Lake Baratarue ... ... ... | 90 | „ | „ | „ |
| Sekoki Hill (highest point) | 310 | „ | „ | „ |
| Lake Jelori (crossing at neck) | 90 | „ | „ | „ |
| „ „ (C.M.S. Station) | 200 | „ | „ | „ |
| Makongeni ... ... ... | 400 | „ | „ | „ |
| No. 2 Stockade ... ... | 600 | „ | „ | „ |

Following the winding course of the river, the stockade was from 100 to 110 miles from the sea.

The river itself may be described as flowing through flat country, here and there interspersed with low hills, and having occasional high banks. The banks of the river are, with few exceptions, low and flat, the bed generally of a very sandy nature until about a mile or so above the mouth, when oozy mud and mangrove swamps are its characteristics. About 25 miles above Makongeni this appearance changes, the sandy bed giving place to a rocky granite bottom, and the current becoming much stronger and swifter.

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The average width, at and below Makongeni, is about 60 yards; narrowing down, however, at one place below Sekoki Hill, beyond which the river opens out again. At its junction with the sea the Sabaki is about 100 yards wide, with a depth of 6 feet, but its course is obstructed by sand-banks. The depth of the river at the Mombrui ferry at low water does not exceed 4 feet 4 inches.

The Sabaki is subject to heavy floods during the S.W. and N.E. rains, some of which are very sudden in their rise; and at the stockade in December and January (when I was there) the river was invariably high, and I have noticed the sudden rise of 5 feet in two hours, the water rushing along like a torrent, and the force of the current being so great as to form regular high waves, carrying fragments of trees, branches, etc. along on their surface. My estimate of a rise of from 8 to 10 feet is most certainly correct, as evidenced by the marks left by former floods.

Below Makongeni the river when in flood overflows its low banks, and spreads over the flat country for some distance on each side, and to this cause is chiefly due the series of lakes already noticed, Lake Jelori itself, as I have shown, being connected with the river. During the rains the river may probably have an average depth of from 4½ to 5 feet, but the heavy current, and above all the innumerable shallows formed by the sand-banks found everywhere along the river-bed, form an insurmountable obstacle to navigation.

In the intervals between the monsoons the river falls rapidly, and all the sand-banks are left exposed, the water falling to a depth of 18 inches, and in very dry seasons to 1 foot. I never heard of the river being quite dry; and this extreme shallowness occurs only during the driest and hottest time of the year, viz. February and March, and never lasts more, on an average, than a month and a half.

The tide is felt probably for five or six miles up the river, and it is within this space that the different ferries are found. They are worked merely by small canoes, crossing being a matter of much time and trouble when many people and goods have to be taken over. A better mode of ferrying, and one that might be established at very little cost, would be by

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VIEW FROM MAGARINI HILL.

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means of a flat-bottomed boat large enough to carry cattle and donkeys, the stretching of a strong wire rope across the river being all that is necessary to render the passage practicable and easy at all times. Such a contrivance would prove of great benefit.

Timber might certainly be floated down the river during the rains, but rafts would not be advisable; the safest way would be to send down the logs merely axe-dressed, either singly or lashed in pairs, for the risk of stoppage on the way would be too great to warrant the sawing of the timber until it arrived below.

Although the river is unfortunately not suited to navigation, there are other equally important ways of utilizing it. I refer to *irrigation*. With the extensive tracts of flat country lying on both sides of the Sabaki river, the possibilities of future development by this means are very great. Channels could be conducted for considerable distances, a work which the steady fall of the land towards the sea would greatly facilitate. The higher the river was tapped, the greater the distance the water could be carried. The returns to be looked for from such a system would of course be considerable, as is the case in India, where, even on the west coast with its abundant rain-fall, irrigation is largely carried on. In Travancore all the important rivers are thus tapped, and the water carried off in channels and distributed over the country for a considerable distance.

With regard to the *forests* in the Sabaki valley, my inspection of their capabilities was chiefly from an agricultural point of view, but there is no doubt that their exploitation would be a work of great importance, yielding valuable results.

At present the local demand for timber is small, and limited to that required for the building of dhows and canoes. With the exception of a few stone houses belonging to wealthy Arabs, Swahilis, and Indian merchants, and the Mohamedan mosques, the towns and villages consist chiefly of wattle-and-daub erections with rough jungle sticks for rafters. A small quantity of timber is exported to Mombasa and Zanzibar, I believe chiefly for building purposes. The development of the coast-lands by European enterprise will naturally bring about



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a greater demand for timber for building purposes and also for exportation, and its increased value will have a beneficial effect in checking the present wasteful destruction of forest trees and bush by the natives.

One product takes a prominent place in the development of the coast-lands and interior: I refer to indiarubber, obtained from the indiarubber vines or *Landolphiæ*, which Sir John Kirk was mainly instrumental in bringing into notice. He also discovered the most valuable variety, the pink rubber of commerce, named after him the *Landolphia Kirkii*.

The thing that struck me most in my travels through the country, was its great adaptability for the cultivation of the most valuable South American species of rubber-producing trees, viz.—

1. The Para (*Hevea brasiliensis*).
2. The Central American Rubber Tree (*Castilloa elastica*).
3. The Ceara (*Manihot glaziovii*).
4. The Mangabeira (*Hancornia speciosa*).

Indeed so important do I deem the matter, that I have annexed (Appendix D) some notes dealing exhaustively with the climate, temperature, rain-fall, and cultivation suited to these trees, and I feel convinced that, after their perusal and a comparison with the description of the country traversed by me, no doubt will be felt that East Africa is destined to become one of the great rubber-producing countries of the world. In reading the reports of Mr. Cross and other authorities on the home of these rubber trees, one is particularly struck with the extreme similarity of the climate, soil, and temperature of the two countries, and it may be noted as a further coincidence that in point of latitude they exactly compare.

When, by the destructive process employed by the South American gatherers, fears of a rapidly diminishing supply drew attention to the possibilities of acclimatizing rubber trees in other localities, East Africa was still unknown. No other country, however, so exactly compares in every way with the original home of these trees.

I was more and more struck with the great suitability, for the cultivation of the Para variety, of the Sabaki river district,

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with its rich soil, low-lying alluvial lands, and numerous lakes and swamps. For the *Castilloa Elastica*, the more friable soil of the forests in the Giryama country would be suitable; and for the Ceara, the comparatively barren country and smaller rain-fall around Mangea Hill; for the country up the Sabaki, with its sandy gravelly soil and huge granite boulders, exactly corresponds with the description given by Mr. Cross of the Ceara rubber country. Lastly, for the Mangabeira we have the extensive forests along the coast from Takaungu to Aroboko, with their grey sandy soil.

Should the introduction of these trees prove successful—and I see no practical reason for doubt—it will completely revolutionize the country, and the marshy swamps along the Sabaki will be transformed from hotbeds of malarial fever to sources of public revenue and private profit. The system of cultivation and harvesting required would be admirably suited to the people, whilst the opening and clearing of the plantations would prove an important factor in the development of the rich Sabaki region. Without suggesting any great scheme of preliminary plantations, I would call attention to the parallel of the Madras Government Cinchona Plantations, as showing what great advantages and profit may be derived from the introduction of a new product by the governing power of a country; while the following extracts will show that similar experiments carried out on the west coast promise to have highly successful results.

"Another difficulty arises from the comparatively small rain-fall of this district, whereas only 500 miles to the southward there is a rain-fall of sometimes over 200 inches; in the Gambia it rarely exceeds 50 inches, and there is practically eight months' drought. As may readily be understood, such climatic conditions are very trying to many vegetable products otherwise suited to tropical life. Nevertheless, there are many valuable plants that thrive even under such circumstances, and the problem is to find and utilize them. I am very sanguine that one of these plants has been found in the Ceara rubber tree (*Manihot Glaziovii*). All the seedlings which I raised have been growing vigorously, and I have carefully collected all the seeds procurable from last year's

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bearing, and intend to distribute them in favourable localities for planting during the next rainy season; as the plants grow equally readily from slips, I shall also raise trees where practicable by these means."[1]

"It may be very well worth while to try and establish the Ceara rubber (*Manihot Glaziovii*) in West Africa. It has apparently established itself at the Gambia in very poor sandy soil and under very arid conditions. It requires little attention, and yields rubber at an early period. It very much resembles the Cassava plant in habits and requirements, and as the natives already cultivate the latter they would be likely to take very readily to the rubber plant. Seed of the Ceara rubber could be obtained in quantities from Ceylon."[2]

Certainly the one drawback to this cultivation is the length of time—probably from four to five years—that must elapse before returns can be expected, and it is this slow return that has principally prevented its initiation by private enterprise.

I would further suggest that an improved cultivation of the *indigenous* rubber vines should be carried on. This could be done at a comparatively small cost, for only the underwood in the selected localities need be cleared, and the vines planted at the foot of the original forest trees. Apart from the quicker returns—for I understand these vines may be tapped when three years old—this would be of service as contributing to the systemization of the local rubber industry. I would also draw attention to the much-needed improvement in the process of collecting the rubber milk. There can be no doubt that the present primitive system of collection is the cause of the *low prices current*. Thin rubber sheets carefully dried sell better than the orange-shaped balls in which the local rubber is exported, for when the balls are cut in two, they often disclose the presence of foreign substances carelessly or dishonestly introduced, a fact which much depreciates the value

[1] Report of March 1, 1889, by Sir G. F. Carter, Administrator, on the Agricultural Industries of the Gambia.—*Kew Bulletin*, 1889.

[2] Memorandum on the Experimental Cultivation of Economic Plants in West Africa, by Mr. D. Morris, Assistant-Director, Royal Gardens Kew.—*Kew Bulletin*, 1890.

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of otherwise good rubber.[1] The *Landolphia Kirkii* is the most valuable of the indigenous species, and should be the one chosen for cultivation.

Two other products are likely to do well in the Sabaki district, viz. *Nutmegs* and *Cacao*. The only drawback to the first-named is its slow growth: it takes from seven to eight years before any returns can be expected. It is, however, a valuable tree, and, I think, a most suitable one. The late Commander Cameron refers to the large groves of wild nutmeg trees that he saw during his explorations in Central Africa.

The *Cacao* tree will grow from the sea-level to an elevation of nearly 2000 feet. It requires the richest forest loam, and it might be grown in conjunction with the Para rubber tree, and also act as a shade to the latter. The cacao is a quick grower and begins to yield in its third year at about the following ratio—

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3rd | year | ... | ... | ... | ... | 1 | cwt. | per acre. |
| 4th | „ | ... | ... | ... | ... | 3 | „ | „ „ |
| 5th | „ | ... | ... | ... | ... | 5 | „ | „ „ |

The forest land around Sekoki Hill would suit this tree well.

The *Castor-oil* plant grows wild over all the country, but its cultivation seems entirely confined to the Wa-Giryama and Wanika, who grow it largely. If a greater demand were created, an increased development of its growth could not be undertaken in better places than in M'Tanganiko and Takaungu; these being the principal trade outlets of the Giryama country, for the distance thence to Kilifi harbour is but short.

Tropical Africa is above all rich in fibre-producing plants, notably the *Sansevieria* yielding the *Bowstring hemp*, which grows in great abundance throughout the country; and we are here again indebted to the energy and enterprise of Sir John Kirk for bringing their commercial value into public notice.

[1] A local Government Order has been issued within the last few months, to the effect that all rubber balls shall be cut in two before being offered for sale.

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The cultivation of *Fibres* offers such important prospects that I gave special attention to the subject, for I consider that there is here also the nucleus of a future industry.

Notwithstanding the very favourable reports on the few samples that have reached this country, the value of *Sansevieria* fibres still appears to be so little known that a few notes concerning them will prove of interest.

Of the twelve species already identified as growing in East Africa, the most valuable fibre-producers are—

(1) *Sansevieria longiflora*, Sims.
(2) „ *Kirkii*, Baker M.S.
(3) „ *guineensis*, Willd.
(4) „ *cylindrica*, Bojer.

*S. longiflora* is found throughout Equatorial Africa, extending on the east coast down to the Zambesi, and Sir John Kirk found it growing abundantly between Pangani and Mombasa. It is of a robust habit; its leaves often attain a length of 9 feet; and a specimen of excellent fibre from one such leaf weighing ¾ oz. can be seen in the Museum at Kew Gardens.

*S. Kirkii* was discovered by Sir John Kirk in 1881, and introduced by him into all our tropical colonies. It compares most favourably with *S. longiflora*, yielding fibre at the rate of 1·69 per cent. by weight of green leaf.

*S. guineensis*, which Sir John Kirk has identified with the "n'konge," is the species which I found growing so plentifully along the banks of the Sabaki river. Captain Lugard, in *The Rise of our East African Empire*, speaking of the "n'konge," remarks—

"It grows in absolutely illimitable quantities over hundreds of square miles, and if found to be of value for export, it could be floated down the waterways of the Sabaki and Tana . . . . a strong fibre which I have found from practical experience to resist decay from damp."

*S. cylindrica* is spread across South Africa from Zanzibar to Angola, and has quite a different appearance from the other species, its leaves—which, when fully developed, are 3 to 4

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VIEW FROM MAGARINI HILL—LOOKING INLAND.

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feet in length—being cylindrical in shape, very dark coloured, and of thick texture.

For further botanical information about these plants I would refer the reader to Appendices B and E.

That I am not alone in predicting a future for the commercial development of these fibres, I quote extracts from a letter to me from Mr. Joseph Foulkis, a gentleman who has large practical experience of the subject.

NOTES ON BOWSTRING HEMP.—"In the early part of last year, I went out to British Central Africa, with the object of seeing the different fibres in their native state, and treating them on the spot with a machine of my own invention. I made Blantyre my head-quarters, marching thence several hundreds of miles, and found them growing in great abundance over a very large area. I observed five varieties out of the ten or twelve known species of Sansevieria. The *Sansevieria longiflora* grows to a height of 12 to 13 feet, and the *Sansevieria cylindrica* to 9 feet, and 4 inches in diameter at base. I found that the natives were using a fibre which they called 'Boase.' It is a remarkable fibre, exceedingly fine and strong, something similar to the *Ranice.*

"From British Central Africa I went to British East Africa with the same purpose of investigating its fibres. Here there is a much larger scope for the industry, for, as you are well aware, the country is literally overrun with them. I found B. E. A. on the whole exceedingly healthy in comparison with B. C. A., where I had contracted fever from which I recovered in B. E. A.

"The specimens I brought home of the *Sansevieria cylindrica* were really very fine. I saw them growing there to the height of 9 feet.

"British East Africa has many more commercial advantages than British Central Africa, on account of its rivers, and being on the coast. I noticed that all species of *Sansevieria* preferred a rich, moist soil, and a comparatively humid climate with shade. They are essentially tropical plants, and do not thrive in a temperature less than 60° Fahr. Under such conditions they grow rapidly, and establish themselves

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permanently by means of large spreading fleshy rhizomes, or underground roots.

"I transplanted some at Mlanji, and in three months they had grown to a height of 15 inches. Two crops a year can be had, provided the roots are placed in a suitable soil; by having two crops you obtain a very fine fibre, but if left to grow to the end of the season, it is much coarser, and therefore stronger, and about the same in colour.

"Hitherto there has been some difficulty in treating the leaves of these plants, which I have been able to surmount. My main object was to invent a machine of strong and simple construction, that the natives could work, and turn out the fibre instantaneously in one operation. I set mine up at Chiromo, and treated the plants with marked success. The boys lay twelve to eighteen green leaves in each gripper at the time, place them on a travelling table, which passes through the machine, and in a few seconds the fibre appears beautifully clean, white, and silky. By my process I am also able to obtain from these plants a valuable pulp for making high-class paper.

"As to the quality of the fibre, the Belfast Rope Company write me they much prefer it to either the Sisal or the Mauritius Hemp for their purpose.

"Messrs. Ide and Christie value it at £20 per ton.

"C. E. Collyer, Esq., Expert Referee for Fibres, etc., for the Imperial Institute, values it at £21 to £22 per ton, it being, in his opinion, superior to the fine *Fourcroya;* you will therefore see that it commands a better price than Manilla.

"The advantages to be obtained from developing the fibre plant known as *Bowstring Hemp* are—

"1. From the *Sansevieria* 3 per cent. of clean fibre is obtained, as against only 1½ per cent. produced from the *Sisal*, *Agave*, and *Fourcroya.*

"2. The cost of preparation is small, through the simplicity and efficiency of the machine, and the abundance of cheap labour. By other systems the cost of production is half the value of the fibre.

"3. The plants are easily propagated, all that is required

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being the gathering of the leaves and roots, treating the former, and replanting the latter.

"4. The superiority of the fibre for its strength and durability, as proved by several experts, especially Sir William Hooker, who says in the *Botanical Magazine* that experiments recently made with the cordage have shown it to be the strongest and best for deep-sea soundings of any known fibre."

As to the *Sansevieria*, it is not a case of fostering a new industry, but of developing what is already there, and of making known and bringing home to the commercial world their value.

In an interview with Mr. Christie, of Messrs. Ide and Christie, on this subject, that gentleman remarked that in these Sansevierias, particularly the *S. longiflora*, the Protectorate undoubtedly possessed a valuable commercial product, and that, in his opinion, the best way of bringing it into public notice was to make a trial shipment of not less than five tons—the fibre to be as long as possible; and the report made upon this would go a long way towards establishing and advertising its value. Expensive machinery is not required, only a careful supervision of the native methods of preparation. The plants are there, and native labour is abundant; all that is wanted is English enterprise and capital.

I am well aware that of late years the value of commercial fibres has considerably decreased, as indeed is evident from the following figures which I take in part from the *Kew Bulletin* of May 1887, quoting the prices given for *Sisal Hemp* since 1879.

| | £ |
|---|---|
| 1879 ... ... ... ... ... | 24 per ton. |
| 1880 ... ... ... ... ... | 27 „ |
| 1881 ... ... ... ... ... | 28 „ |
| 1882 ... ... ... ... ... | 28 „ |
| 1883 ... ... ... ... ... | 27 „ |
| 1884 ... ... ... ... ... | 21 „ |
| 1885 ... ... ... ... ... | 19 „ |
| 1886 ... ... ... ... ... | 21 „ |

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| | May 1887. Per ton. | | May 1892. Per ton. | | May 1897. Per ton. | |
|---|---|---|---|---|---|---|
| | £ | s. | £ | s. | £ | s. |
| *Manila Hemp* ... | 31 | 10 | 28 | 0 | 15 | 15 |
| *Sisal Hemp* ... ... | 32 | 0 | 23 | 0 | 15 | 0 |
| *Mauritius Hemp* ... | 29 | 0 | 21 | 0 | 21 | 0 |
| *New Zealand Hemp* | 29 | 0 | 19 | 0 | 14 | 0 |

For the prices in the foregoing table during the last ten years (May 1887 to May 1897), I am indebted to the courtesy of Mr. Christie, to whose interesting letter in Appendix B, I would refer all those more particularly interested in this matter.

*Jute* cultivation was another industry to which I gave attention in connection with the Sabaki district. I see no reason why this cultivation cannot also be successfully introduced. Being identical with the cotton plant in its requirements, there are many suitable areas available; for instance the Tana river district; the only question being whether the permanent discolouration of the Sabaki river would have an injurious effect upon the colour of the fibre.

I come next to the *Ramie* or *Rheea*, a variety of China grass belonging to the nettle family. It can be so easily cultivated, the plants being perennial and yielding a fibre of excellent strength and fineness, that it at once suggests itself as a good product. It requires a moist and stimulating climate, and though growing well in all soils, a light loam appears the best suited to its requirements. The great drawback, however, is that as yet no perfect machine exists for decorticating its fibre.

*Pineapples* too could be more extensively grown, if the extraction of the fibre from the leaves could be made remunerative. I found them growing in the Giryama country as well as on the coast-lands.

Apart from the foregoing, there are already many products now cultivated for which the country is eminently adapted, and which are capable of very considerable extension, but to accomplish this, special care and encouragement are needed.

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## CHAPTER XIII

### MAGARINI—JOURNEY TO MOMBASA, *viâ* ROKA AND KONJORA

Cotton—Acting as Arbiter—The Watoro Register—Start for Mombasa—The Hot Season—Roka—Brackish Soils—Konjora and its Creeks—M'Tanganiko—Kilifi Creek—Experiences on Board a Dhow—Visits to Zanzibar and Pemba.

FROM the end of January to February 24 I was kept busily occupied at the shambas, where I now had, as the reader may remember, a new overseer—Mohamed bin Hussein.

On my return I was naturally much interested in the result of my experiment in cotton cultivation, and was glad to find the plants had come on remarkably well, being from 1½ to 3 feet high, very regular, and many of them covered with ripe pods.

I put on a few women and girls to gather the pods, and was much pleased with the appearance of the cleaned cotton, the staple being of fair length and very white. I now made arrangements for the systematic carrying on of the work. Two nakoas, selected from the best of the Wanika, were told off to superintend the picking and cleaning, for until the arrival of a ginning machine, the cotton would have to be cleaned by hand. The plan I followed was to have the cotton that was picked each day thoroughly dried, and then carefully gone over by some of the most intelligent Wanika girls, who were kept permanently at this work. I soon had a considerable quantity of cleaned cotton, and felt quite proud of its appearance. Of course I had my usual peck of troubles with the people, generally arising out of trifling, but to them



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important, matters, such as quarrels, wife-beating, thefts, etc., and it was amusing to notice how they still adhered to many of their old customs. Thus my formal consent to a marriage was always asked for by the contracting parties. There was a good deal of sickness at times amongst them; they appeared particularly liable to chest and lung complaints, which often proved fatal.

The new overseer was a zealous and hard-working man, and the various shambas soon presented a very different appearance from what they did when I first saw them. The metamah and oil-grain harvests had been good, so what with the sale of these grains and considerable estate produce, prospects appeared flourishing, for we had also collected the considerable number of 18,600 coco-nuts from the estate trees.

In my daily walks to and fro I had often remarked in the neighbourhood of M'Pandiani shamba a very well-kept-up banana plantation, belonging, I was told, to an Arab who did not grow any other produce. He kept his slaves constantly cleaning and weeding the plants, which certainly looked remarkably well. The fruit he exported to Lamu.

Immediately after my return, M'Doro, the Wanika head-man, accompanied by a large number of his people, came to see me, and brought me fowls and a quantity of eggs. They had only heard of my return the night before, and came to see me at once. They now fully realized the advantages of paid labour, and made most anxious inquiries as to when I should want Wanika again, declaring that the whole of their village was ready to come when required, and finally made a request which gave me much pleasure. They asked my permission to open up new land for cultivation close to Magarini Hill. I told them that I was delighted to grant their request, and informed them that it was the Company's intention to experiment with various products, such as cotton and tobacco, the seeds of which I would supply to them, so there would be work available for all, men, women, and children. The Wanika seemed thoroughly pleased, and frequently gave expression to their satisfaction during my short address. I then went off with them to look at the land they wanted. It was situated

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CAMP IN SHAMBA ABEDI—MAGARINI PLANTATIONS.

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about two miles away in a low valley, and to get to it we had to cross a deep hollow spanned by a temporary bridge, the country around being thick bush with a rich black loamy soil.

Henceforth I had no trouble with the Wanika ; the numbers which now came daily averaged between forty and eighty, and I had every reason to be pleased with the results of my endeavours in this direction.

The following day a M'Toro from Makongeni informed me that all the people had gone down to Jelori to have their names registered as free men, as I had advised them to do. But on

WANIKA VILLAGE NEAR MAGARINI.

my sending a messenger to Mr. Hooper to inquire about it, he wrote that not a single M'Toro had yet arrived although the river had been fordable for days.

I accordingly sent a message to Makongeni to be delivered to M'Soma in these terms—

"I have received to-day a letter from Mr. Hooper telling me that no Watoro have yet come to Jelori, although I understand the river has been fordable for the last week. My messenger has orders to tell you that you will be allowed seven days to go to Jelori to have your names written down. After that time I shall send to Jelori to ask Mr. Hooper for



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the list, and if no one has come down I shall write to Mombasa to say the negotiations have fallen through. I have been good to your people, now let me know what you intend to do."

My messenger came back after six days accompanied by eight Watoro, who brought me a reply from M'Soma to the effect that there had been a great deal of small-pox on their side of the Sabaki, and that this alone was the cause of the delay. I took down the names of the eight men who had come with my messenger to be registered, and nine days later fifteen more arrived, this time from the north side of the river. They explained that they had not gone to Jelori as they had heard that Mr. Hooper had left for Mombasa, and that it was quite true that they had much sickness amongst them; that M'Soma himself was very ill and had sent them down to ask what they should do. I took the names of these men also, making one hundred and fifty-nine in all, and told them to tell M'Soma that if Mr. Hooper was absent Mr. Burt was there, and they could go to him, and I should hope to hear soon that they had all done so. Notwithstanding the bad name they bore on the coast, I took a liking to these modern Ishmaelites, my experience of them being that they appreciate and respond readily to just treatment. Only your yea must be yea and your nay, nay—once having said a thing you must abide by it. They look up to and trust Europeans, and it is greatly to their credit, I think, to be able to say that of all the Watoro I employed at the stockade, I had not to punish a man once. It is not to be expected that after their wild life in the bush they would settle down at once to regular and steady work, or that they should desire to break up their settlements formed for mutual protection, until they are well assured that they will not regret it.

One morning a Swahili woman came to see me. She wanted me to give her medicine, as she thought her face was too black! I gave her three packets of Epsom salts, one to be taken every three days, and hoped it would have the desired effect of improving her complexion and satisfying her vanity!

One of my watchmen, named Mabruke, came to me one

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morning and said that his wife, Hawazaow, was dead. Only the day before he had come to me for medicine for her, and in the course of the day I learnt some strange facts regarding their beliefs in witchcraft.

Mabruke believed his wife had been bewitched by a "machowi" or wizard. The Swahili people firmly believe in these practices. The wizard, I was told, buries some medicine at the entrance of the hut, and the doomed individual passing over it dies shortly afterwards. I asked, "What does he do it for?" and the reply was, "To eat the dead body!" It appears that after the body is buried the wizard throws some sticks at the grave, calling on the body to arise, which it does, though no outward signs show that the ground has been disturbed. Mabruke it seems had consulted a Swahili doctor, who told him his wife was bewitched; and it was said Mabruke knew the culprit, and was going to watch the grave that night on purpose to catch him when he came to eat the body. All the shamba people attended the funeral, which took place the same evening; the body was simply wrapped in a winding-sheet, and, water having been poured over it, it was put into the ground close to the husband's house. Mabruke seemed very grieved, and said they had been betrothed when quite little children. The women all sat in the verandah, singing death songs, and when the body was brought out they uttered a melancholy wail. Poor people—I was getting to know them and their ways better, and could not help liking their simple natures.

I sent for Mabruke next morning, and in the meanwhile I asked Mohamed, the overseer, what he thought of this wizard and vampire business. He evidently believed in it too—the superstition appeared to be very general. The "machowi" in question was supposed to be one of the shamba people. Mabruke declared that he had no doubt it was a "machowi" who had killed his wife; he believed the individual to be one of his fellow-labourers, and asked me to summon all the nakoas before me, and threaten punishment if the wizard or "machowi" did any more sorcery. He told me he had sat up all night by the grave, and in the course of the afternoon I noticed that he had placed some heavy sticks

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and stones over it. Ramazan and Mohamed both assured me that if a man wished to get rid of any woman's husband, witchcraft (poisoning?) was often resorted to. I asked Mohamed what he thought of Mabruke's request, and he said that it ought to be complied with, for Suliman's people were bad. So, in the hope that it might have a good effect, I decided to speak to all the nakoas next day. When they were assembled, a good many of the others being also present, I told them why I had called them before me, and asked Mabruke to mention whom he accused. At first he refused, but after a while he named two nakoas, but could bring no proof against them. I then spoke to the people, telling them that witchcraft was all nonsense, and said that if any man should be found dealing in the black art he should be severely punished. The overseer addressed them to the same effect, and they were then dismissed. This no doubt warded off some deaths while I was there!

The average *shade* temperature during January and February was as follows—6 a.m., from 69° to 74°; 2 p.m., from 84° (one day as low as 80°) to 95°; 6 p.m., from 78° to 82°.

I had now, after a month at the shambas, to start for Mombasa for the purpose of proceeding to Zanzibar and Pemba, the object of my visit to these islands being to investigate their agricultural capabilities.

Before leaving the mainland, however, I had to visit a property near M'Tanganiko, which the Company had purchased from some Germans, and my journey from Melindi to that place by way of M'Shaka, Roka, and M'Tondoa, led me through a portion of the country which I had not seen before.

Leaving Melindi, I followed the telegraph-line over a gently undulating country, through the now familiar landscape of open country and scattered baobab trees. These trees were now without a leaf, for it was the hottest time of the year, and the whole country was parched and dried up. The cultivated area around Melindi extends on this side for about six miles, the furthest shamba being called Matagi. Here I passed through a thick grove of Hyphæne palms.

Beyond Matagi I entered forest, and the country beyond up to M'Shaka alternated between forest and bush, and dry,

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NATIVE LABOUR—FREED SLAVE WOMEN—MAGARINI PLANTATIONS.

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shallow, flat, sandy back-waters. The path, as is usually the case, keeps, where possible, close along the sea-shore. By the back-waters the heat was terrible, 120° to 125°. There was neither shade nor breeze, and the blinding glare from the white sand made it worse. Very little water was to be got on the way at this time of the year, and my porters, poor fellows, felt the want of it very badly. We reached M'Shaka (seventeen miles from Melindi) at 2 p.m. I halted awhile under a shed, where a large dhow was being built, to allow the straggling porters to come up, and then moved on to the nearest water-hole. Here I enjoyed my crowning experience of African travel. The water in this hole was simply liquid mud, and to drink it you had to cover the cup with your handkerchief to keep the mud out of your mouth, sucking the liquid in through the cloth!

I made some tea, which, even with the liberal addition of tinned milk, resembled a black draught more than anything else. This with some egg curry and bread and jam, served at 3.30 p.m., constituted my breakfast.

I left for Roka at 4.30 p.m., and noticed that the low-lying land or valleys were covered in places with bare patches of white glistening salt incrustations, but otherwise the growth of the grass did not seem affected in any way. There was, however, no other vegetation. We reached Roka at sunset, and as the well in the town was dried up, the people were getting their water from another well, in the low valley outside the town. The water from this, though drinkable, had a decidedly brackish taste. Apparently all this low-lying land was impregnated with salt. It is a matter for regret that coco-nuts could not be cultivated in these low valleys, but unfortunately the coco-nut palm, though thriving in almost any soil except stony ground—even in marshy land exposed to the action of sea-water—will not grow where the salt is formed in crystals by evaporation.[1]

[1] With reference to these brackish soils the following information may be of interest—

"It has been found by experience in India that the planting of the rain tree (*Pithecolobium saman*) is a most effectual means of improving the character of land rendered sterile owing to saline efflorescences. *Salt*

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Leaving Roka on the morning of February 28, a tramp of ten miles through forest and bush brought us to M'Tondoa, from which we started the same afternoon for Konjora. M'Tondoa, with its straggling houses, surrounding cultivation, and grey to black loamy soil, I have already described. Lions and buffaloes were said to be numerous in the surrounding forest, and I noticed several of their tracks outside the town. The path led through thick bush, low scrub and grass, with occasional large trees, the soil being a grey sandy loam. The country was burnt and dried up, but where burnt the grass was shooting up again.

About half-an-hour from M'Tondoa the bush gave place to open grass lands, with scattered clumps of trees and some wild sago palms. After crossing an open stretch of country and a low flat valley with high grass (probably under water in wet weather), I came upon a small shamba containing castor-oil, bananas, and pineapples, with some fine cashew-nut trees. There were some very good patches of sweet cassava round some houses. Continuing through open grass country, interspersed with coco-nut and mango trees, I approached some low hills to the west (the direction I was now travelling), and here the country became a succession of ridges and valleys, the bush growing thicker, until I entered a forest district with large open glades and scattered bush, the soil alternately red to black loam, red predominating.

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*Bush.*—A parcel of seed has reached us from Brisbane, having been sent for experimental cultivation. The seeds, which are those of a *salt bush* (most likely *Atriplex spongiosa*), are as small as mustard-seed, but flattish, and are contained in a spongy cover. The salt bushes are used as fodder, and *are especially suited to dry saline soils*, the only specimens indigenous to Ceylon being *Atriplex repens*, mentioned by Thwaites as occurring in the north of the island. *Atriplex spongiosa* is described as being particularly good for sheep pasture. *Atriplex nummularia* is one of the tallest, most fattening, and wholesome of the salt bushes for sheep and cattle. Sheep feeding upon it are said never to be affected by liver fluke, and to get cured if suffering from the distomum worm and other allied parasites. *Atriplex halimoides*, a common dwarf shrub, is also a good forage plant, whilst *Atriplex vesicaria* is described as the most fattening and most relished of all these salt bushes, holding out in the greatest extremes of drought."—*Tropical Agriculturist*, November 1892.

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The high ground hereabouts commanded an extensive view of the valley I had been traversing and of the sea beyond it, about five miles off, my route having hitherto been parallel to the coast. Judging from the nature of the soil, and the appearance of the occasional coco-nut trees growing, I considered that the whole of the flat country I had first crossed was eminently adapted for coco-nut cultivation.

Proceeding westward across the hills, the ascents of which were fairly steep, and covered with thick forest of very fine trees with dense undergrowth, the soil became more chocolate in colour and very friable. When I reached the highest point of this ascent, I judged (not having an aneroid with me) that the elevation above sea-level was 450 to 500 feet. The summit was flat with several abandoned clearings upon it, and numerous dead forest trees killed in the usual way by fire; the soil a rich chocolate. Descending the hill, the forest gave place to large open clearings, and from this point there was an extensive view over the low-lying lands on the other side—the country presenting the appearance of a series of low ridges and valleys, covered with grass and bush, but evidently at one time under cultivation. The direction of the path presently changed from west to south-west, and the soil half-way down became a stiff black loam with a good deal of sandstone in it. The ridges were abrupt and the descents steep. From about here I got a good view of Konjora, situated on the edge of a low valley at the mouth of a back-water running up from the sea.

Konjora consists of two slave villages surrounded by coco-nut trees—healthy, vigorous, and in good condition. The whole country round here belongs to Salim bin Hamisi, the Liwali of Takaungu, who is all-powerful. I camped in the valley below one of the villages, and although Salim bin Hamisi was living here at the time, he never came near me. Being very tired I did not regret it. He sent me his greetings, together with some very acceptable young coco-nuts, and supplied me with a guide. I started for M'Tanganiko at daylight next morning.

The Konjora creek is an arm or branch of Kilifi Bay, which winds inland right up to M'Tanganiko. A dhow can go up

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with the tide, the first part by sailing and the latter by punting with poles, taking three hours to reach M'Tanganiko.

Konjora is also accessible to dhows, and at full tide the creek is quite impassable except by boat. I crossed in a canoe, and after a stiff climb up the high ridge which divides it from the larger Kilifi back-water, I descended into a long, deep, narrow bay, skirting the back-water, where it is thickly edged with mangrove swamps. I noticed a few cultivated patches here and there, with some papaw trees and castor-oil plants, the soil varying from a stiff black near the sea to a more friable loam inland, with occasional outcrops of sandstone.

Leaving the valley, the path led to another steep ridge with a good many fan palms, the top being level, and presenting the same appearance as the other, viz. thick bush with a stiff brown soil. After crossing another valley, also with a very steep and abrupt descent, I finally arrived at M'Tanganiko.

I need not trouble the reader with a detailed description of the property I had come to inspect. Suffice it to say, that its site had not been well chosen, for it lay in a low valley periodically flooded in the wet season by the N'Zovoni river.

I had intended to travel overland the whole way to Mombasa, but the heat was too great, and I thought it would be too hard on my porters to attempt it, so I decided to postpone my visit to the remaining part of the coast till a more favourable season.

A large dhow being about ready to sail to Mombasa, I decided to go down in her with my porters, etc., but as she did not sail until the afternoon I took the opportunity to have another look round the town, the houses of which are plastered with red clay, apparently the characteristic of the ridge on which it is built.

This ridge overlooks the N'Zovoni river where it flows into the Kilifi creek. Many of the houses are situated close to the water's edge, all loads of grain and produce being carried on board the various dhows through the mud and shallow water.

It took me and my porters a good hour to float the dhow, which was stuck hard and fast in the mud, but we finally got

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off at 4 p.m. The creek, which is bordered on both sides by a thick fringe of mangroves, some of them very large trees, is at first narrow and very shallow, but it gradually deepens and widens out as one proceeds. After an hour's punting through the winding channel, our progress constantly checked by the mast catching in the overhanging branches of the mangrove trees, we passed the Konjora inlet.

The south side of the creek appeared all forest and bush, fringed with dense mangrove growth. The north side was cultivated, and very noticeable from the red nature of its soil. After passing Konjora creek, the back-water gradually widens out into a fine open waterway, low hills covered with forest and bush sloping down steeply to the water's edge on both sides, with a fringe of mangroves and black oozy mud. We reached the Company's Custom House at M'Narani at 7 p.m., and anchored for the night in Kilifi Bay to await the turn of the tide at daylight next morning. I had dinner on board, and passed the night in my chair. Sleep was impossible, owing to the awful smells from the mud swamps and the bilge water and shark's flesh on board the dhow, so I smoked most of the night, and was heartily glad when we weighed anchor at grey dawn next morning.

We had a smooth passage and a favourable wind, and running along close inshore the whole way, we reached Mombasa at two o'clock the same afternoon. It was great pleasure to reach civilization once more and to meet Europeans again. I remained in Mombasa till March 15, when I sailed for Zanzibar and Pemba in the mail steamer *Ethiopia*. A detailed account of these visits will be found in another portion of this volume.

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## CHAPTER XIV

### SHAMBA LIFE—JOURNEY TO MOMBASA AND BACK

An Unpleasant Voyage—Mr. Weaver becomes my Assistant—The Wet Season—Rain-gauge—Shipment of Copra—Transport Questions—Rats and Snakes—Revisit Jelori—Change in the Attitude of the Watoro—Somali Children—A Hard March—Lions—Watamu—The N'Zovoni River—Meet Bishop Tucker at Frere Town—Mombasa again—Rabai Mission Station—Through the Giryama Country—An Enthusiastic Reception.

I RETURNED from Pemba Island on Saturday, April 9, 1892, having left Weti at 6 a.m. in the Sultan's steamer *Kilwa*, and arrived at Mombasa at 2 p.m., after a delightful voyage of eight hours.

I was detained there on various matters till the 15th, when I left for Melindi, accompanied by Mr. Weaver, who had been appointed my assistant on the Magarini shambas.

We sailed early in the morning in a very small dhow, a great contrast to the comfortable *Kilwa*, for what with the rough sea, heavy scuds of rain, the smells on board, and sea-sickness, the voyage was a most unpleasant one! We reached Melindi in the dark after thirteen hours' pitching and tossing, and as a wind got up we were nearly wrecked on the rocks outside. We fired two shots as a signal to Bell-Smith to send a boat for us, and when I landed I was so weak that I could hardly stand.

Leaving Weaver behind at Melindi to send up the loads, I proceeded next day to the shambas, and after a very fatiguing march, feverish and sea-sick, I reached my old camp-shed at Shamba Baraka at dusk. Here another travelling experience awaited me—I had no lights, the box of



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CAMP-SHED, SHAMBA BARAKA—MAGARINI PLANTATIONS.

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candles having been left behind, and as the cooking oil was also forgotten, perhaps it was just as well that I ate my dinner in the dark! All next day I could do nothing, being ill with fever, caught, I fancied, in Pemba.

I remained continuously on the shambas until the following September, Mr. Weaver taking charge at Magarini whilst I looked after other portions of the estate.

The wet season was now at its height, with daily heavy downpours of rain—not coming down steadily as on the west coast of India, but in a series of squalls of wind and rain. I had established a rain-gauge, and whilst absent one week I left it in charge of nakoa Feruzi; on my return I was amused to find that he had been so afraid of any one stealing it that he had taken it into his house every night, only putting it out in the open in the day-time!—too careful a record for my purpose! One of my first occupations was putting down some seeds and cuttings I had brought from Zanzibar and Pemba—vanilla, cinnamon, nutmegs, and Ceara rubber. On my way I had identified a Ceara rubber tree—probably originally introduced from Zanzibar—growing in a garden in Mombasa; it was luxuriant and healthy and its appearance encouraging.[1]

[1] I also carried out some interesting experiments with a variety of seeds sent out by the Company, and an extract from my Report for May 1892 may prove of interest—

"*Red Barley.*—One field has been set apart for this. The absence of a plough has necessarily been a great drawback, I having had to line and peg out each separate drill or furrow, which was afterwards well dug over. The whole of the seed received—six bags—has now been carefully sown under my direct supervision, and I trust the result will be satisfactory.

"*Linseed, Lentils and Barbary Beans.*—The whole of the above supply of seeds has been sown, and the result will be duly reported.

"*Special samples of Millet* (*Dhurra*).—This has also been sown, and I propose to distribute the seed obtained for sowing next year to the cultivators round here. This introduction of fresh seed should prove most beneficial.

"*Rats.*—I would also call attention to the great damage done by rats to sown grain; they have dug up and destroyed a good deal of barley, and the damage they cause to cultivators is much complained of, the first sowing being often entirely destroyed by these vermin."

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I had also received 446 lbs. of Sea Island cotton-seed, and a large tract of land in a flat valley, with a rich black loamy soil, was being rapidly cleared for sowing it. I had another clearing prepared some distance away for New Orleans seed, so as to keep the two varieties quite distinct; this latter did not germinate so well as the Sea Island variety, and rats proved very destructive to it.

The old cotton was also doing well, and by June Mr. Weaver had eight acres under cultivation. When cleaned, apart from its being a very short staple, it suffered from the want of a proper ginning machine, being too much tangled

COTTON FIELD—MAGARINI PLANTATIONS.

and pulled about to be sent home as a fair sample of the first African growth. As previously mentioned, it had been picked from two-year-old cotton plants originally planted by Suliman bin Abdulla (judging from the flowers, evidently mixed seed), and from the young cotton sown by myself, mostly Dharwa seed. The cotton, moreover, had been picked by unskilled labourers, to whom the work was entirely new.

I had great confidence in the Sea Island cotton as the variety most likely to do well, and my belief was not entirely speculative, or based merely upon the adaptability of the soil. Experiments had already been made and attended with a degree of success sufficient to encourage strong hopes. Sea

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MORNING MUSTER—MAGARINI PLANTATIONS.

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Island cotton grown in Mombasa in very light soil that had undergone much previous cultivation, had been valued by brokers in England at an average of 4¾*d.* per lb. The same variety grown by German planters at Lamu was valued at 9*d.* per lb.

The experiment was therefore well worth continuing, and I may mention here that it was afterwards so far successful, that samples from these plantations were pronounced to be worth from 6½*d.* to 8½*d.* per lb.

The Wanika continued to give satisfaction, and Mr. Weaver was very pleased with them. Many of the Wa-Giryama showed their real interest in the experiments by coming down to see what was being done at Magarini, and amongst them was the important chief Toyo Wabakulo, who declared his intention of sending some of his people down to learn and work with us.

In June I received a supply of castor-oil seeds and Indian ground-nuts sent out by the Directors. These I arranged to have sown in Nasur bin Suliman's shamba, where the soil was more suitable, and the situation more central amongst other native plantations for cultivators to watch operations. The Liwali of Melindi sent to ask me for a supply of both these seeds, and I requested Mr. Weaver to distribute castor-oil seeds amongst the Wanika and the Wa-Giryama, as I thought the cultivation of this better variety should be specially fostered amongst these two tribes. We sowed four acres with the Indian ground-nuts, which are larger than the native kind. The seed arrived rather late, but was good, and the plants were soon above ground.[1]

[1] Reporting to the Directors of the Company in June 1894, Mr. Weaver mentions having then 140 acres under ground-nut cultivation, sown with three tons of the last year's produce, and says that the neighbouring cultivators fully realized the value of this product, and were much disappointed at the non-arrival of seed from Zanzibar which they had made extensive preparations for sowing. "The three tons of nuts planted" (says Mr. Weaver in his Report) "have germinated extremely well, and with ordinary success we have reason to expect a return of at least 100 tons, but unfortunately quite 55 acres have been eaten up by rats. I think now, however, the plants are too big to be eaten, and that we are henceforward safe under this head, and I see no reason why we should

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I sent down to the coast for shipment 10½ tons of copra, the produce of 65,000 coco-nuts.[1] The value of East African *copra* and the importance of developing its export is evidenced by the broker's report on this trial shipment—

"Your small shipment created great interest in this market, and excepting Cochin, we have rarely seen finer copra; the nut is of great beauty and thickness and well matured, and the quality is fine. It is also well sun-dried, and fairly clean and suitable in every way."

This lot realized the very excellent figure of £14 5*s.* per ton, being £1 higher than the current ruling prices. This fine copra is used on the Continent principally in the manufacture of margarine, and goes to the best mills. Its yield was reported to be as high as 64 per cent. of oil.[2]

In the gathering of coco-nuts, I arranged for the trees to be inspected regularly every two months, and allowed only the ripe nuts to be taken. The copra was of course all sun-dried, being carefully covered with mats during showers; and I could see no reason why, with proper care, it could not be regularly dried during at least eight months of the year.

The transport of the produce from the shambas to the coast caused me some anxiety and trouble. The Sabaki had to be crossed on the way, and owing to the want of a proper ferry and the numerous crocodiles, pack animals could not be used. My first instalment of copra I sent down by porters. I could

not reach my former estimate of a 60-ton crop. I do not think there will be any difficulty in pushing the cultivation of ground-nuts—the people are eager enough."

This plague of rats in 1894 proved very destructive to all cultivation, and Mr. Weaver speaks of much damage being caused to the coco-nuts, cotton (quite ten acres of the New Orleans variety having been destroyed through the seeds being eaten), and maize. His neighbours were in a still worse plight; their rice and metamah had been eaten up, and their maize had been re-sown no less than five, and in some cases six times over!

[1] "We have gathered 120,000 coco-nuts as against a total of 90,000 for 1893."—Mr. Weaver's Report, June 1894.

[2] "*COCO-NUT OIL.*—Copra or copperah, the dry albuminous pulp contains 54·3 per cent. of oil; dried at 100° it yields 66 per cent."—Simmonds, *Tropical Agriculture*.

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BREAKING COCO-NUTS FOR COPRA—MAGARINI PLANTATIONS.

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have loaded it in bags and sent it down by camels, but the wear and tear of the frequent loading and unloading which the crossing of the river would necessitate was against this plan, to say nothing of the risk of heavy loads of over five frasilas being upset and damaged. I therefore arranged a system of camel transport, by which the copra was carried in loose mats, one set of camels working between the shambas and the river on one side, and another set between Melindi and the other bank. Two sheds were erected at the river, one to receive and store the copra as the camels brought it down, whilst at the other, after being ferried across in canoes, it was weighed, packed, and sown up by my own people in "makandas,"[1]

[1] These makandas were made locally. All the mats and mat-bags in use locally for exporting grain—including those in which the Magarini copra was packed—are made from the leaves of the fan palm, a dwarf species allied to the dum palm (*Hyphæne thebaica*), which grows abundantly all along the coast. The cut leaves from the palm are called in Swahili "miaa."

The making of mats, etc., appears to be confined to the Guniah and Shehiri people—the latter Arabs from Sheher in Arabia.

The Guniahs do not consider the leaves of the dum palm strong enough, and certainly the texture of the fan palm leaf is infinitely stronger and better adapted to the purpose. The Guniahs at Gongoni obtain their supplies of leaves around Ras N'Gomani, from whence they are brought down by dhows.

One double makanda will hold five frasila (180 lbs.). I succeeded in getting the Guniahs of Gongoni to make mat-bags at the following rates—100 double makandas at twenty-three and a half rupees. The dimensions are 4 feet 9 inches long, by 2 feet 8 inches wide.

The above rates and dimensions compared favourably with Lamu prices, and the bags are stronger and better made. The Guniahs held out a long time for four annas a bag, remarking that if they took up mat-making it would henceforth be their livelihood instead of cultivation, but I pointed out to them that if their prices were too high native cultivators would not buy. They accepted the lower rates.

I gave them an order for 200 makandas, paying them half the price in advance to enable them to start, and promised to order from them all the mats required on the shambas for drying grain.

I may remark, that mat-bags are far cheaper than gunnies, which cost $15 per 100, and one gunny bag would not hold more than 80 lbs. of copra at the outside.

The following comparison will show the saving in price—

200 makandas costing 47 rupees will hold 1000 frasilas.
200 gunnies „ 64 „ „ „ 457 „

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of five frasilas each. (N.B. The frasila on the mainland = 36 lbs., or 1 lb. more than the Zanzibar frasila, which equals 35 lbs.) I made arrangements with a contractor in Mombrui and Melindi to supply the number of camels required from time to time, and the arrangements worked very satisfactorily. The weight a camel can carry is surprising; on one occasion six camels each carried a load of 540 lbs. from the shambas to the nearest store-shed!

I ascertained that the camels in use all came from Kismayu, and are valued at from $40 to $50 a head—about the same price as a good Muscat donkey. They are fed on dates, grass, and green leaves. Mombrui having more bush, suits them better than Melindi. They require care, and do not thrive well at any distance from the sea.

I also cleared a road 10 feet wide to the Sabaki. This road, about five miles in length, was easy and well adapted for camels, and shortened the distance to the river considerably. The cutting of a 20-feet-wide road all round the shambas was another task. This also served as a fire boundary, much damage having been caused just before my return from Zanzibar by a fire spreading to one of the plantations from outside. One or two other much-needed roads were made through the shambas, and these, together with the systematic work now in force, soon caused the plantation to assume a new appearance.

The establishment, under regulations, of an Indian shop both at the village of Boma-Upandi and at Magarini, for the benefit and encouragement of the Wanika, was another project worth mentioning, and one in which the Liwali of Mombrui took an active interest.

We hoped that the display of cloths, etc., at their very doors would stimulate the people to work in order to obtain them, either by their wages or from the sale of their produce.

Mr. Weaver was now living in a temporary hut on Magarini Hill, this being most conveniently situated for the supervision of the cotton and other experimental cultivation and the Wanika labour. I had my quarters in the outlying Nghanima shamba, on a low knoll commanding a distant view of the sea and the Mombrui Hills. I was driven from

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DRYING COPRA—MAGARINI PLANTATIONS.

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my old quarters in Shamba M'Pandiani by the nightly songs and dances of the estate people in their village close by, often kept up till a very late hour, and as I did my writing at night I moved to a quieter spot.

My shed was an open one, and besides admitting plenty of fresh air, afforded me many a beautiful view of the distant sea in the lovely moonlight of the tropics. I have spoken of rats, and many a sleepless night these vermin caused me, not exactly by worry over the damage they were causing to cultivation, but by racing about my shed, upsetting bottles, cups, plates, etc., and frequently compelling me to turn out. With snakes too I had some acquaintance. One day I killed a snake inside the hut, and told one of my people to skin it. He brought the skin minus the head. On inquiring the reason, I was told it was the custom when venomous snakes were killed, to cut the head off and bury it to prevent wizards making a bad medicine out of it!

Another day a dead python was brought to me which had been killed in a neighbouring shamba whilst attacking a goat. It was already coiled round the poor animal, the third it had killed, and showed fight, but was shot. It measured 12 feet 6 inches in length.

On another occasion some Arabs brought me a python they had killed in the bush; it was 14½ feet long. The people told me that pythons after killing their prey always look to see if there are any ants about, and that if there should be, they will abandon their prey and go away. Whether this is true or not I cannot say. If it is, it shows a wonderful instinct, as the snake lying gorged and torpid while digesting its meal would be entirely at the mercy of the ants.

Puff-adders were amongst other unwelcome visitors, and I killed two inside my hut. These snakes are most deadly; fortunately they are very sluggish in their movements.

My nakoa Ambari appeared to possess special power over these snakes, which the natives, who thoroughly believed in it said was derived through a "charm": thus one day he arrived dragging by a rope fastened round its neck a large puff-adder he had caught in one of the plantations. The snake was

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quite unharmed, so I thought it a good opportunity to send it to England. I got a box ready, but the difficulty was how to get the snake into it!

Before I could prevent him, Ambari stooped down, unfastened the rope round its neck, and lifted the snake into the box, where it remained perfectly quiet and passive. As it was a good three days' overland journey to Mombasa, Ambari suggested putting a couple of hen's eggs in the box as food on the way, actually placing one near its head without its attempting to touch him. I nailed up the box securely, and sent it off the same day by a special messenger.

I subsequently heard that the gentleman to whom I sent it for shipment received a rather startling shock when the box reached him; I had placed a large placard on the box notifying its contents, for the voyage to England, and had written a note to him asking that a stronger box should be made. The gentleman forgetting the letter and thinking the box contained some curios, took it to his house, and placing it on a table with the placard downwards, endeavoured to open it; luckily he found it difficult, and turning it over, lo and behold the notice—"This Box contains a Live Puff-Adder!!!" stared him in the face!

The snake reached England safe and sound, and was sent by the Directors to the Zoological Gardens in Regent's Park, where I had the pleasure of seeing it on my return home.

Ambari brought me another puff-adder a few days afterwards, but one was enough, so I told him to kill it, which he did in a curious manner. The snake was lying almost in a straight line: Ambari walked up close to its head—it never moving—and placed his stick gently upon its head, and then drove it through to the ground. I observed that Ambari after handling the snakes had a trembling fit, and, if he could, would get drunk on coco-nut toddy. A message was brought to me one day that one of the estate women had been bitten by a poisonous snake, which had escaped. I found her in great pain, and vomiting, and her left leg (she had been bitten in the ankle) greatly swollen. I tied a tight ligature above the wound, which I lanced, bathing it freely in warm water, and gave her nearly half a bottle of raw whisky. After an

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EAST AFRICAN CAMELS.

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hour there was a decided improvement, and when I went to see her next morning she was almost well.

In September I found it necessary to go again to Jelori, this time travelling direct from Magarini by the native path I have spoken of before, instead of going up as formerly by Melindi.

My present visit had reference to a question concerning the Church Missionary Society settlement there. Mr. Hooper had called attention to the settlement of undesirable people in

MR. WEAVER'S HUT—MAGARINI.

close proximity to the station, and desired that a boundary should be delimited, within which the Mission should not be intruded upon by objectionable outsiders from the coast. I was quite at one with Mr. Hooper in the matter, and as we held the same views in regard to the improvement, moral and industrial, of the native tribes, it was very easily arranged.

As the reader is aware, it had been my idea to bring down the Watoro from Makongeni and settle them at Jelori. This, however, I was obliged to abandon for the present, owing to

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a change in the attitude of the Watoro, brought about by hostile Arab influence. I therefore proposed that an experimental plantation should be established outside the boundaries of the Mission property to be worked by the Wa-Giryama and neighbouring aboriginal tribes alone, and that the products to be introduced to include jute, Egyptian, Sea Island, and New Orleans cotton, tobacco, castor-oil, and indiarubber. By this means the whole of the land round the lake and the Mission would gradually be brought under cultivation.

As the land would thus be taken up by degrees, either by the people of the Mission or by the Wa-Giryama, and all undesirable people consequently excluded, the object Mr. Hooper desired would be secured under the Company's guarantee, without the necessity of delimiting boundaries, and to this proposal Mr. Hooper cordially agreed.[1] This then was the object of my present journey.

[1] The proposed plantation at Jelori was thus referred to in a letter of September 27, 1892—

"I have specially noted the interesting communication from Sir John Kirk suggesting—

"1st. The formation of a small nursery garden, say of about four acres, under the charge of a skilled Kew gardener, where useful plants, suitable to the country, could be carefully cultivated and distributed.

"2nd. That many plants and seeds could be obtained from the private experimental garden established by Sir John Kirk in Zanzibar.

"3rd. The suggested experiment of *Olive* cultivation, and the inquiries made as to the present cultivation of new products.

"I will take up these questions in their order—

"NURSERY GARDEN.—This suggestion is altogether excellent, and the suggested plantation at Jelori offers a favourable site for its formation.

"GARDENER IN CHARGE.—A trained native gardener from one of the Government Botanical Gardens in India or Ceylon would be thoroughly competent to take charge of one at a very much smaller salary than would have to be paid to a European.

"CULTIVATION OF NEW PRODUCTS.—Concerning this I would suggest that first attempts should be directed to the encouragement and extension of such known products as are suitable to the Coast-lands, such as *coco-nuts*, *cotton*, *tobacco*, *ground-nuts*, etc. This, I would point out, apart from its own desirability, is very necessary in order to stimulate and develop the now undoubtedly declining coast cultivation. Once this is well under weigh, I would recommend that the introduction of all new

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Leaving Magarini at 8.30 a.m. I traversed the same low-lying bush and forest country as previously described, and was again struck with the deep black soil, so well adapted for the growth of cotton. The Sabaki having been reached at three o'clock—I had made several halts on the way—I waded across the river, then about 2½ to 3 feet deep, first firing one or two shots into the water to frighten away crocodiles. I then sat on the bank to dry and to await my cook and breakfast, but as he did not turn up I was glad to reach Mr. Hooper's hospitable house.

Whilst waiting next morning for the inevitable "shauri" with the various head-men, I punted out to the island in the lake, and succeeded in shooting a big hippo, which was lying with its head exposed about 30 yards away. In the afternoon I had a very satisfactory interview with the principal head-men from both sides of the river, who again expressed their readiness to forward my plans by every means in their power.

In the afternoon, strolling along the shore of the lake, I successfully stalked a sleeping crocodile, which I bowled over with a bullet through its spine. I was always glad to kill one of these horrid brutes!

I dined with Mr. Hooper that evening, and was much interested in some Somali children—the first I had seen—who had been sent up from Mombasa. It was quite amusing to watch their wrath and indignation on my telling them in fun that they were Gallas and not Somalis—one of them, a rather nice-looking girl about ten, actually cried with vexation. "It is not true; we are Somalis—the Gallas are the slaves of the Somalis!" they exclaimed.

products deemed suitable to the country should be strongly taken up, as by that time the natives will be better able to understand and avail themselves of them. This is how the important question of the development of cultivation presents itself to me, and as a further means of extending it, I would strongly urge that either the Magarini shambas, or more particularly the suggested plantation at Jelori, should be made the Central Station for all experimental cultivation, and, after suitable experiments have been made, distribute, with the necessary directions, the seeds and plants to the various stations and districts in the Company's territory. The monthly Report from this Central Station would convey a full and detailed account of the progress of agriculture and cultivation."

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The following day, Saturday, September 10, I started off on what turned out to be a very long and hard march. Having long wished to examine the country on the other side of the lake, I now resolved to take this opportunity of doing so, as it was now necessary to know this part of the country.

Toyo Wabakulo, the Giryama chief, who had stayed to wish me good-bye, declared it would take me two days to go round the lake, and asked me to fire a gun to let him know where I would camp that night, and that wherever it might be, he would send me supplies. Mr. Hooper, however, assured me that at the most it would only take five hours; that Mr. Burt had once been compelled to travel round that way owing to the other road being flooded. I quote from my diary the following notes of my journey—

I started punctually at 7 a.m. from camp.

"WESTERN SIDE OF LAKE.—At first open glades and black soil—then forest—black loamy soil—track which is much overgrown, frequently winding round the bays of lake—flat shores flooded in rains—well adapted for Egyptian cotton.

"SOUTHERN SIDE.—Open forest with red soil—a good deal of iron in soil—southern side more hilly—then skirting slope of Sekoki Hill till 10.30 a.m., when emerged on open rocky land (iron). From here obtained a lovely view over the whole lake lying below. Then tramped for an hour through thick forest, but no large trees. Soil red—a great deal of 'n'konge,' but mostly small. Further on soil more chocolate and loamy, with larger trees."

I was still following the slope of Sekoki Hill, eventually arriving at the ford at the bottom of the hill, where I joined Weaver's road. Here I halted to rest and get water, and allow my porters to come up. I had a pailful of honey, which Toyo Wabakulo had given me. I passed it on to my porters, who regaled themselves with it, though I warned them how thirsty it would make them. We continued along the new road, which I was sorry to notice was getting overgrown; it was intensely hot. We got to my old camp at Méré shamba at 4 p.m. Here I got some green coco-nuts, and drank the contents of about

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A "SHAURI" WITH WA-GIRYAMA AND WAKAMBA CHIEFS AT JELORI.

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five straight off! My porters had been most willing, and had kept up with me all through, so I offered to camp where I was for the night, and go on to Melindi next day.

But all were keen to go on, so after a hasty meal of tea and biscuit and potted meat we pushed on at 5 p.m. It got so dark before we arrived that we ended by losing our way, eventually getting into the outskirts of Melindi and having to retrace our steps along the beach, finally reaching our camping-place at 7.30 p.m. Helped to pitch my camp by lantern-light and sat down to dinner at 8.30 p.m. It had been a hard day's work, as we were marching steadily for a good eleven hours with only one hour's rest. We must have walked considerably over thirty miles. I was very pleased with my people. They had kept up most bravely all through this burning hot day. I told them how satisfied I was, and gave them double posho (food allowance) as a reward. The next day, after seeing the Liwali and the Company's officer, I returned to the shambas. The grain harvest was now well on, and the first time I was present at the reaping of one of our metamah fields, I was rather taken aback by all the estate women, the moment work was stopped, suddenly making a demonstration in my honour by forming themselves in a sort of procession and running round me waving small flags made of red cloth, and screaming shrilly. This was an ovation that I was not prepared for!

I was startled a few days afterwards by being told that a gun and the mutilated fragments of a human body had been found about a mile down the road I had recently cleared to Sabaki. The unfortunate man had been pulled down by a lion. My people were greatly alarmed, and declared that every year many people were killed by lions, and that this was their season for coming down. A case was related of a lion actually trying to claw a woman out of a hut on an adjoining shamba, her leg being badly hurt; another of a man being carried off from Shamba Baraka the year before. My cook was in a great state of alarm and begged for a gun, but I told him he had a door to his house, while I slept in an open shed, and I thought the lion would visit me first! The next day we were told that a donkey had been killed outside Melindi,

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and I wondered if it was by the same lion. There was a good deal of excitement over these dangerous visitors, and at the remoter houses drums were beaten all night. There was no doubt that lions were about, as several were roaring all night, sometimes unpleasantly near. I gave out a rifle to my two servants who lived in a hut close by, and kept a lantern burning outside my hut, and a loaded rifle handy. Two lions and a cub were reported to be near the Sabaki going about openly in the daytime; the people were so much alarmed that they shut themselves up in their houses. Eventually the lions departed as suddenly as they came.

A Suria (concubine) of a neighbouring Arab shamba-owner came one day to complain to me of her owner having ill-used her; on inquiry it turned out that he had only slapped her with his hand for something she had said or done. I told her the hearing of such complaints concerned the Company's officer at Melindi, and offered to send her there. As, however, she refused to go, I sent for her lord and master and persuaded the woman to return to him, as I thought her complaint a trivial one, but warned him that if ever a serious complaint was made by a slave I should interfere at once.

On another occasion a freed woman living at Boma Upandi came to complain of her husband, a Shehiri Arab; she wanted a divorce because whenever he went away from home he locked her up. To this she strongly objected, saying what would happen to her supposing the house caught fire! I thought that very likely the husband might have private reasons for shutting her up in his absence, but promised to lay the matter before the Liwali.

Another day a brother of Ahmed Bedwin (another neighbouring Arab and a great shikari) came to complain that although his brother, who had gone off on a shooting expedition, had left him in charge of everything, yet on trying to enter his brother's house, one of the slaves had prevented him and actually beaten him, saying he had no orders to let him in!

I suggested waiting till Ahmed Bedwin's return, when the two could come to me and talk it over. This was done, and everything was satisfactorily arranged and explained; but I was surprised at the licence permitted to slaves as

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RECEIVING A WANIKA DEPUTATION AT MY CAMP-SHED IN SHAMBA NGHANIMA.

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evidenced by this case, and at one daring to raise his hand against an Arab!

The grain harvest being now over, I availed myself of the slack time that followed to go down to Mombasa, having to see the Administrator on various important matters.

I left on Monday, September 19, travelling overland. I followed my new road to the Sabaki, and after catching up my porters and losing much time through continually missing the way, I found myself at length on the road to Watamu. Had breakfast under a mango tree, and then started off through forest and bush, with occasional open shambas, and latterly over a continuous outcrop of coral. Watamu, about eleven miles distant from Melindi, is a pretty little town picturesquely situated on a small bay with numerous coral rocks. There is a fine sandy beach in front of the town, which belongs to Salim bin Hamisi of Takaungu. Low bush and plentiful outcrop of coral rock are the chief characteristics of the country round the town, with the usual open cultivation. I was surprised to see so few coco-nuts grown. A few dhows are built here. I camped near the custom-house, my tent being the centre of the usual curious crowd.

I left next morning at 6 a.m., travelling along the sea-shore, having been told this was a much shorter way than going round by M'Shaka. The beach was sandy with numerous high coral rocks, and so slippery that we had to crawl over them further on, to avoid the rising tide, several of my porters getting falls.

At eight o'clock we crossed the deep bay called Uyambu creek in a canoe, the current being very strong. Beyond we struck inland to reach Uyambu, a small town or village, which we reached at nine o'clock. It is not on the sea as shown in the maps. Thence through continuous bush with occasional but very few shambas, we arrived at Roka at 11 a.m. and at M'Tondoa at 4 p.m. Here I stopped for the night.

Next morning, September 20, I started on a new path to Konjora, having been informed that by sleeping one night on the road I should reach Rabai (the Missionary Station near Mombasa) by 4.30 the following day. This new path was a much better one than the one I travelled by when last here;

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the lay of the land was more level, and nearly the whole of the way was through fine forest country with many wild cycads. Coming out on the high ridge above Konjora I descended, as before, a very steep path leading to the small ridge above the sea-creek.

I halted here to rest my people and to get water, and then was off again to M'Tanganiko, one hour distant, where, after some stiff climbs up the ridges, I duly arrived, to learn that Salim bin Hamisi was there. I walked over to his house to call on him and had an interesting conversation. He was most cordial, and presented me with a fat sheep. He had just heard that the Uganda Railway Survey caravan had arrived in Mombasa, all well. He desired me to tell the Administrator with his salaams and respects that he was ready to furnish men for railway work if required.

I started off again at 1.30 p.m., now marching through—to me—quite unknown country.

The river flowing through this valley was, I was told, *not* the Kilifi, but the N'Zovoni river. This river and another flowing from Fuladoyo (shown on the maps as Voi) meet at M'Tanganiko, and both fall into the Kilifi creek.

The N'Zovoni river is said to be a large stream flowing through the Giryama country, with a depth of 4 to 5 feet in the wet season, but drying up in the hot weather, when only occasional pools are found in the hollows of the rocks forming its bed. It enters Kilifi creek through a narrow opening at the top of the valley. Following the path, I passed through numerous Wa-Kahomo clearings, and over flat rich valleys and low ridges, getting an occasional glimpse of the N'Zovoni river, which I was told flows through this part of the country for some distance ahead. At 3 p.m. I came upon the very large native village, Kaya-Kohomo, which is the chief village of the Wa-Kahomo people and about six to seven miles' distance from M'Tanganiko. Mr. Burt, the missionary from Jelori, was camped here on one of his proselytizing tours, so I halted for the night.

I went down to look at the N'Zovoni river flowing close by; it was now narrow and shallow, but the people told me that during the rains the volume of water was very much increased.

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A NATIVE DANCE

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I was much interested to find that these people cultivated coco-nuts, chiefly I am afraid for the manufacture of "tembo" (toddy), but they also sold some nuts. I also visited a fairly large plantation situated close to the river, surrounded by some very fine forest trees. The coco-nuts were very lanky, being planted exceedingly close together, and intermingled with some orange and papaw trees.

I dined with Mr. Burt, whom I was sorry to find not at all well, and no wonder, as he had to rough it a great deal.

I was very sorry to hear of the frequent quarrels prevalent amongst the native villagers, chiefly confined to the Wa-Giryama, fights being the result. No poisoned arrows are, however, used in inter-tribal quarrels. I heard of a Giryama under the influence of "tembo" splitting open the skull of a little babe in its mother's arms. To atone for this the man would have to give up two men, and it is the difficulty in obtaining these men that leads to the frequent fights.

A big devil dance took place in the village and went on the greater part of the night, and prevented me from getting much sleep.

I bade good-bye to Mr. Burt early next morning, the next stage on my journey being a place called Manzai, said to be seven hours away, which, I was told, was the nearest place where we should find water. We camped for breakfast at a Wanika village on the way and got water from a hole, rested here an hour and set off again, reaching Manzai late in the afternoon. This place lies in a lovely hollow, with coco-nuts (as usual too close) and a charming brook of clear pure water —a very great treat! In the night I heard a leopard growling close by. I went after him, but it was too dark to see anything.

After a hard tramp over many low hills, and through some coco-nut cultivation, passing Ribe (London Missionary Society's station), three hours from Manzai, I reached Frere Town, the seaside station of the Church Missionary Society on Mombasa Harbour, at 3 p.m. Here I had the pleasure of calling on and having a cup of tea with Bishop Tucker, who was then preparing to start for Uganda.

I remained at Mombasa twelve days, having several impor-

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tant conferences with the Company's Administrator, who entered into strongly, and warmly supported, my proposals for the agricultural development of the coast-lands. I found the Railway Survey party back in Mombasa; they had completed their task under the command of Captain Pringle, Captain Macdonald having had to return to Uganda to report on the fighting which had been going on there.

On September 27 I accompanied Mr. Berkeley to Frere Town to say good-bye, and wish God-speed to Bishop Tucker, who was that day starting for Uganda, accompanied by seven English missionaries. It was quite an impressive and touching

FRERE TOWN BAY.

spectacle, all the Christian converts crowding round the Bishop, whilst the Mission children sang hymns.

On October 4 I started on my return journey to Magarini, intending to proceed by Rabai and the regular caravan route through the Giryama country. My party was increased by twenty-one of the estate people, who had just been paid off from a returning caravan from Uganda, and were now returning home with me.

Crossing the ferry at Makupa, between Mombasa Island and the mainland, I found that the land rises from the water in a series of bare and exposed ridges, beyond which extends a flat cultivated area with coco-nut and banana shambas,

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while further on the path crosses two back-waters divided by steep ridges. Beyond these I came upon a small village surrounded by coco-nut trees. Their appearance was encouraging, and judging from the soil they were growing in, I could see no reason why their cultivation should not be largely extended here.

Passing a third back-water, fringed with mangroves, and crossing in a due northerly direction over broken country, chiefly grass, with scattered bush and fan palms, the country became more hilly, till the low ridge of the Rabai Hills, 600 feet in elevation, rose in front. Cultivation was again apparent, and I passed some good castor-oil and coco-nuts scattered in clumps, camping below Rabai, another C. M. S. station ten and a half miles from Frere Town and about eleven from Mombasa.

The Rev. Mr. Jones, a Swahili clergyman whom I visited here, gave me some useful information concerning the Mission Station and surrounding country, and I was much interested to learn that the Society had constructed a large reservoir capable of holding a sufficient supply of water for one year should the absence of rain cause the usual supply to dry up. The depth of water in the deepest place is 12 feet. This is most enterprising, and reflects great credit on the Society.

There was heavy dew at night, and at this comparative elevation the night felt quite chilly after Mombasa. I struck camp and left at 6.30 a.m. The path led through Rabai, a fair-sized village, the large iron-roofed church being a noticeable object. Half-an-hour's march beyond I crossed the river Kombe, which was nearly dry, the water lying in the hollows of the rocky granite bed. For six miles beyond, going northwards towards U-Giryama, the country was grassy and undulating, with low hills all round and the land fairly well cultivated, and I was pleased to notice a large number of coco-nut trees, irregularly planted but of a healthy appearance, which I understood had been planted by the Wanika and other converts of the Rabai Mission; the luxuriant guinea-grass bore witness to the richness of the soil.

It seems to me that a company or syndicate could do much to develop this portion of the country by establishing an

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agency at the end of Rabai creek, and purchasing copra and coir from the people, with another depôt at M'Tanganiko or some other suitable place. The whole of the Giryama country could thus be tapped, and a ready purchase of native produce would increase its cultivation, an easy means of export being afforded by the Kilifi back-water, which is navigable by dhows or steam launches up to M'Tanganiko. Such a scheme would be profitable to those undertaking it and of great advantage to the country.

The soil may be summarized as follows—

For six miles round Rabai, of a rich dark to grey loam often of great depth; beyond of a rich black loam in the valleys with a red porous clay and sandstone subsoil; on the ridges of a more friable chocolate to brown, in places reddish, indicating the presence of iron. About twelve miles from Rabai we halted for an hour in a fine coco-nut clump, situated in a lovely valley with a spring of water, named Amasha, belonging to a tribe called Wa-Gibana, who I understand live close to Manzai.

Starting again at noon, and still proceeding northwards over a grass country apparently well-inhabited, judging from the numerous tracks branching off on either side of the path, I passed one or two solitary borassus palms with many scattered coco-nut clumps, which I remarked were growing chiefly in low hollows or valleys. They were very healthy as a rule, but too closely planted, and the ground below was usually choked with grass.

After passing a stream called Chilani about fourteen miles from Rabai, the country became decidedly hilly with a good deal of Giryama cultivation, gradually merging into open forest, the trees having a very silvery bark. The forest gradually became thicker (mostly young trees growing very closely together), the soil a very friable loam grey, with granite rock. I noticed several cycads and some very large-leaved *Sansevieria* growing here.

Once through this, the country became more open but still hilly, until, at 6 p.m., I reached the N'Zovoni river, where I camped for the night.

The N'Zovoni, which I went down to examine, here flows

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NATIVE VILLAGE.

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through a narrow deep gully. The river-bed, of dark-coloured rock, was then quite dry with the exception of a few pools of rain-water, but the Wa-Giryama informed me that the river is fully 5 to 5½ feet deep in the rainy season, and often quite impassable, thus confirming what I had been told at M'Tanganiko. I estimate the distance from here to Rabai to be twenty-one miles.

The following morning felt quite chilly, and I noticed my breath made vapour as at home! Leaving at 7 a.m., and crossing the N'Zovoni river, I continued in a northerly direction through level open forest country, crossing a small stream flowing through a valley, in thick forest, with a good deal of granite rock. Forest alternated with scattered Giryama clearings till I struck the direct path to M'Tanganiko at 8.35, or four miles from the N'Zovoni river, the other path continuing on to M'Waiba, said to be six miles from M'Tanganiko. The same description of country continued beyond, and the soil everywhere appeared very good and of a brown to chocolate loam. In one part of the forest I passed a thick growth of euphorbia, and afterwards in open country patches of pine-apples, many of them forming regular clumps. These latter grow wild and spread rapidly, proving how readily they could be cultivated if required. *Sansevieria guineensis* was also most plentiful, growing amongst the forest undergrowth.

I reached the Company's shamba at M'Tanganiko at 10.45, and after a brief rest went on to the village of that name, which I estimated to be about twelve miles from my last camp on N'Zovoni river.

Thence I proceeded to Konjora, and was delayed by having to visit Sheikh Salim bin Hamisi, who had now moved thither; after drinking some coffee and sherbet with him I finally left at 2.50 for M'Tondoa, which I was glad to reach at 5.30 p.m. I camped here for the night.

Leaving M'Tondoa next morning I halted at Roka only long enough to rest my people and give them water, and then pursued my journey. It was fearfully hot marching; we travelled along the telegraph-line, which had been recently cleared. The high bush and forest on each side completely shut out every breath of air. About noon we reached

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M'Shaka, and I was glad to halt for breakfast at the same delectable water-hole that I described on my journey down to Zanzibar. The water was as black and thick as ever, and the tea made from it was like ink! I drank it, however, which was more than I was able to do at the water-hole further on. This was on the outskirts of the Melindi shambas, the porters discovering it close to the path; they brought some to me, declaring it to be "sweet" and "beautiful," but it smelt so horribly that, thirsty as I was, I had to decline it with thanks —the first time I had not been able to drink African water, so the reader can imagine what it was like!

That evening I camped at Matagi. I had about three men to a load, but even so they quite knocked up with the heat, and it was not till long after dark that the last man straggled in.

Next day we got back to the shambas and made quite an imposing entry. One man had a drum, and another blew vigorously on a penny trumpet he had bought in Mombasa, and with the flag waving in front we marched in triumphantly. All the women in the shambas who knew of the returning Uganda porters raised a shrill cry of welcome as they passed by, and I was not sorry to see my humble shed once more.

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ARRIVAL OF THE NUBIANS AT MAGARINI.

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## CHAPTER XV

### LAKE KRAWA

Nubian Labourers—Proposed Visit of Sir Gerald Portal—Start to explore Lake Krawa—Arab Shikaries—My Caravan Astray—A Long Fast—Oil Palms—Lake Krawa and the Kilifi River—Game—Mosquitoes—Reconnoitring the Country—Return to the Shambas—Scarcity of Grain—Disinterested Arabs—Flooded Back-waters—Dead Beat—Sir Gerald Portal's Mission to Uganda—A Shooting Party—A Lion Story—Christmas at Mombasa—A Wretched New Year's Day—Fever—Mango Crop—Mr. Weaver's Work at the Shambas.

THANKS to Weaver's watchful supervision all was going on well on the shambas.

Lions had again made their appearance, and made an awful row the night of my return, roaring all night through. Weaver, who had come down to see me, and had walked back to Magarini after dinner, wrote next morning that they must have been very close to him as he went home.

I was glad to receive a satisfactory report of the behaviour of a recent addition to the estate labourers—some Nubians from Emin Pasha's Equatorial Province, who had been brought down to Mombasa by one of the Uganda caravans. Not wishing to go to Egypt they came up to these plantations, and appeared to be industrious and willing.

While at Mombasa, Mr. Berkeley told me that the Consul-General at Zanzibar (the late Sir Gerald Portal) proposed visiting the Melindi district, and would be glad to get a little wild-game shooting at the same time, if this could be managed. He asked me to make any necessary arrangements.

When last at Marereni I had heard a good deal of the game to be found one or two days' march to the northward, parti-



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cularly at Lake Krawa, a large swamp or lake some distance above Marereni; so I determined to go and have a look at the place, and see what were its possibilities in this respect. Accordingly I started for Krawa on October 13, with a few porters, accompanied by Bwana Ahmed Bedwin and his brother, Arabs, and both noted shikaries, who had killed all kinds of larger game—lions, elephants, etc. They also possessed a thorough knowledge of the country I wanted to visit.

Nothing of special note occurred during the first part of our journey; it was high tide, and all the mangrove swamps along our path were flooded; Bwana Bedwin said that a similar high tide occurred every ten days.

After leaving Gongoni, we had for some time been following the direct path to Marereni, when the Arabs suddenly struck off to the left, saying it was much shorter. All my porters were behind, our front party consisting only of the Arabs, myself, an Arab soldier, and my faithful head-man Dumgu; so I sent the last-named back to tell the porters of this shorter road, and to say that we would await them at a small pool some distance ahead, about six miles from Marereni. We waited some time at this pool, and as the porters did not appear, I sent off the Kiroboto or Arab soldier to look out for them. Two o'clock passed and still no sign of them. Bedwin fired off his gun twice on the chance of their hearing it, and then sent his brother to look for them.

After a very long time the Kiroboto returned from Marereni and reported no sign of the porters; then Bedwin's brother presently returned, also unsuccessful, and matters began to look serious. The Arabs told me it was the custom of porters when left alone to simply march on and on!

We were all very hungry, and the five of us shared a metamah biscuit which the askari had with him. I was just about to send him off a second time when Dumgu at last appeared with a tin of biscuits. He had found the porters, and they were following him; it seems they had passed our turn to the left, and where they had gone to goodness only knows; they were marching straight ahead and trying to overtake me, when luckily they heard Bedwin's two

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shots; so they had already turned back when Dumgu met them. All's well that ends well: we were very glad of the biscuits, as it was then 5.30 p.m., and we had been without food since 5.30 that morning!

It was too late to go any further that day, so we camped

MY HEAD-MAN DUMGU.

by the small pool, and I had a long chat in the evening with the two Arabs, whom I entertained with coffee and cigarettes.

We struck camp early next morning, leaving exactly at 6.20 a.m., and travelled first along back-waters—two of which

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we had to wade across—then through mangrove swamps, until, striking inland, we passed through open country, consisting of very flat plains with good grass and clumps of trees, amongst which I noticed some oil palms (*Elæis guineensis*). We passed some fresh elephant tracks close to a small rain-water pool, and at 9.30 a.m. came upon Lake Krawa.

Lake Krawa lies in a valley closed in on the eastern side by sandy hillocks, and on the western side by rising ground covered with bush and open grass glades. This lake (or perhaps more accurately swamp), of large extent in the wet season, never entirely dries up. The water is hidden by a thick growth of long aquatic grasses with which the swamp is almost completely covered. The shallower portions dry up in the hot season and are clothed with bright green grass, which forms a favourite pasturage for large quantities of game.

The small river Kilifi, flowing into the sea twelve miles north of Marereni, drains Lake Krawa, and is said to be navigable for small dhows for nearly an hour from the sea. It is very difficult to follow upwards, as its banks are covered with a rank growth of high grass and Hyphæne palms, and cut up by numerous channels, which are rendered a very quagmire of oozy mud by the numerous hippo that frequent the river. Nearer to the sea it is enclosed by mangrove swamps, and the decaying vegetation, deep thick mud, and dead trees that border it render progress almost impossible; the soil is a black oozy mud of considerable depth, the water good. The mangrove timber of Kilifi river is largely cut, and is in much demand in Lamu; most of the dhows built there are made from the timber obtained from the Kilifi and Tana rivers.

As we marched round the lake to look for a good camping-place we came upon six "Topi" (a large variety of hartebeest) quite close to us, and further away three more. They were quite close, and stood watching us curiously. I was greatly tempted to fire, but was afraid of startling the game; we saw a large number of game tracks, the varieties found here being chiefly kudu, topi, and one or two other varieties of antelope and water-buck. Zebra as well as ostriches were said to come down in large numbers in the rains; also elephants and

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rhinoceroses. I found a capital camping-place on a low hill close to the lake, and very convenient for getting water.

In the afternoon I explored a good portion of the lake and some of the adjoining country, being struck with the numbers of lion tracks I came across; in one place I saw the fresh tracks of five.

The night air was very pleasant with a delightfully cool breeze, but the mosquitoes were simply awful, they were in legions! Then about 9 p.m. one lion began to roar, then a second, then a third, till at last it sounded as if there were a good dozen close by. This lullaby went on nearly the whole night. The porters were thoroughly frightened, and kept big fires burning till morning. I was not sorry to see daylight appear, for we had not built a thorn fence around our camp.

Having brought only a limited supply of food we had to return next day, but I had seen quite enough to satisfy me as to the kind of game to be found here. It would be still more plentiful when the N.E. rains had set in.

Before starting on our return journey next morning I went forward with the two Arabs for about two hours to observe the country ahead. We saw more topi, and on our way back found fresh lion tracks coming towards us; the beasts evidently suddenly got our wind and turned off. A Galla whom we met on our way equipped for a long journey, with two spears, a small axe for getting honey from the hollows of trees, and two sticks for making fire, reported that in the country to the north there were numerous topi, and a few rhinoceroses, elephants, and ostriches, but that the giraffes had suffered from the disease which had played such havoc among the wild buffaloes.

Coming back it was very hot. We reached camp at eleven o'clock, having been away four hours. I had a big drink of water which was more than tepid, but refreshed me greatly, and a bath soon made me feel quite another man. The two Arabs were dead beat, and went fast asleep after their meal. We left for Marereni at 1 p.m., arriving there at 6 p.m., the place being like a small town from the large number of orchella-weed collectors camped all about.

Next day I returned to the shambas. The next month

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passed quietly and uneventfully; there were a few cases of drunkenness from "tembo," and one man actually got drunk on eau-de-Cologne, which he had bought from an Indian trader.

I found great difficulty in disposing of shamba produce, on account of the people having all gone up to gather orchella-weed. Money was very scarce owing to the season's bad crops, and grain was very dear just then—metamah selling for nine pice a kibaba (about a pint), the usual rate being three pice.

The twenty-one Uganda porters were to have gone to work after a three weeks' rest and holiday, but at their urgent request I granted them another week's leave, thus making it a full month's holiday.

One hears so much said now-a-days to the detriment of the Arab, that I think it only fair to chronicle the following—

When the Arabs, Bedwin and Said, who had gone up with me to Marereni, came to visit me after my return, I gladly offered them a remuneration for all their hard work up there. Bedwin flatly declined to receive anything; he said I had shown his brother and himself great honour, and that was enough for both. I prevailed upon them, however, to accept a box of biscuits, some Eno's Fruit Salt, a table-knife and some cigarettes, and delighted both immensely by showing them the pictures in Thomson's book, *Through Masai Land.*

Ali bin Salim, the Liwali of Mombrui, came to see me one day to consult me about a project he had much at heart, which did him the highest credit, and is a remarkable example of the broad views of an enlightened Arab gentleman. This was about the opening of a school at Mombrui, where a beginning could be made in teaching the English language to Arab children. He proposed to begin with ten children of the leading families of the place. The idea was entirely the Liwali's own, and the whole expense was to be borne by him. Such an undertaking could not but appeal to one's warmest sympathy.

It was now near the time of Sir Gerald Portal's visit, so I prepared to start again for Lake Krawa, and left for Marereni on Nov. 7, Bedwin and Said coming with me as before.

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SENDING ESTATE PRODUCE TO THE COAST.

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Although the N.E. monsoon rains had just begun to fall, it was intensely hot marching along the dry beds of back-waters, with the sun beating down upon us. I was simply wet through with perspiration, and we were all glad to make frequent halts under trees to rest and drink water. In the evening, wending our way along the beach, we had some unexpected trouble in getting through the back-waters. The first one was very deep with a strong current running, and it was a long time before we could find a place shallow enough to cross. Said went in several times to try, but had to swim back again. At last I found a place, and went in first; the water was nearly up to my neck, with a strong current. I remained in the water for over an hour helping to pass the porters and their loads across, until all had safely reached the other side.

Then, just as it got dark, I overtook the porters, and found them halted before another back-water; some had tried to cross it, and had been nearly carried out to sea. It had been a neap tide which had gone up far inland, and there was a great volume of water rushing back like a mill-race. I tried it in two places, but the water was too strong for me, and I had to give it up.

Said wanted to abandon the attempt, but I said "Nonsense," it meant camping on the beach all night without water, and we must get across somehow! I went in again, taking half the porters with me, holding each other's hands, and then impressed everybody to form a chain across, and so got everything and everybody safely over at last. We reached Marereni at 8.30 p.m., and I went straight to bed after dinner, dead beat.

We reached Krawa next day, going to our old camp on the hill. We saw several herds of topi, and eight Dyke's antelope, which the Swahili call "Dendara." In the night an elephant trumpeted quite close to the camp.

The next few days the men were busy putting up huts and clearing water-holes; I felt seedy for some time—the effect of my long stay in the sea-water, where probably I got a chill. I noticed on some of the bushes close by a large green fruit, which I understood was called "Matonga"

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or "Mabungu." It becomes yellow when ripe, and is said to be very sweet, and is eaten by the Wasania; monkeys are also very fond of it.

Although there were daily, as a rule, sharp showers of rain, the heat was very great; one day the temperature at noon in my tent was 98°.

I had great trouble to prevent my porters from talking and laughing loudly, regardless of the fact that they were frightening the game. The mosquitoes still contributed to the comforts of the night, but the lions seemed to have withdrawn, and the nights were quite silent except for the occasional bellowing of the hippo in the Kilifi river.

At last I had every preparation completed—a total of nine huts built, with water supply, etc., and the Liwali of Mombrui was to send up milk, vegetables, and fruit—so I went down to Marereni to await Sir Gerald Portal's arrival. The following day, however, I received news from Mombasa which made a complete change in the proposed arrangement.

Sir Gerald Portal and Mr. Berkeley had received instructions to proceed at once on the now well-known Mission to Uganda, after the successful accomplishment of which the country had to mourn the untimely loss of one of its most able and successful diplomatists, Sir Gerald Portal dying of typhoid fever shortly after his return to England.

However, as the Consul-General could not come, he had asked General Hatch, commanding the Sultan's troops in Zanzibar, and the officers of H.M.S. *Philomel*, commanded by Capt. Campbell, to avail themselves of the arrangement I had made, and very soon the vessel's lights were reported, and she anchored off Ras N'Gomani on the evening of December 6.

We had a very good time for the few days they were up, having amongst other things some exciting hippo-shooting, killing seven and wounding several others. Some Wasania came down attracted by the firing, but we could not get them to swim across the river after the dead hippo. They said it was an ill-omened river, and that a short time before a party of ten Swahilis had attempted to cross it and not one had succeeded, all having been pulled down by crocodiles.

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An amusing incident of the expedition was that which befell a small party from the ship, who had gone inland after game. On their return they reported having seen, first one lion, then fifteen, and finally an uncountable number of these terrible animals. They turned out to have been baboons!

I spent the following Christmas at Mombasa, having gone down there comfortably in an Arab dhow, and had the pleasure of being in time to bid good-bye, with wishes for a successful journey to Uganda, to Mr. Berkeley, who also received

ARAB DHOWS—MOMBASA HARBOUR.

a farewell address and a piece of plate from the European officers of the Company.

I returned from Mombasa on January 1, 1893, accompanied by Dr. Edwards, of the C. M. S., who was going up to Jelori, and I think it was about the most wretched New Year's Day that I ever spent. We sailed in a small dhow for Melindi, starting early in the morning; a heavy swell was rolling into the harbour, and we were both soon very miserable—in fact we both collapsed with sea-sickness on getting out into the open. There were frequent squalls of rain, and as we lay prostrate on the deck we were soon wet through, utterly miserable from the smells, motion, and heavy pitching caused



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by tacking against a head-wind. We reached Kilifi Bay at 4.30 p.m., and anchored at the entrance.

We went ashore, where we found a hut, and had some coffee, but were too seedy to eat. We slept till 2 a.m., when we had to return on board; we sailed again at 3 a.m., and had to endure bad smells and wretchedness for another day. At first the sea was fairly calm and the wind in our favour, but, alas! with daylight matters changed for the worse. The sea got up with a strong head-wind, and the old tedious business of tacking began again with heavy squalls of rain. Needless to say, we again succumbed, and soon became and felt miserable objects!

We eventually reached Melindi at 11.30 p.m. Dr. Edwards put up at the Company's house, but I preferred my breezy old camping-place in the Liwali's shamba. I returned to the Magarini shambas next day, and was then laid up with my first serious illness since my arrival in the country, brought on doubtless by the recent wettings and exposure.

It is only when one is run down—seedy, helpless, and alone—that one realizes all the discomforts of living beyond reach of civilized ways and comforts! The worst part of it was that the people would not let me alone, but as I lay in bed, the sun terribly hot and the air oppressive, they came worrying me incessantly about all sorts of petty things. It was some days before I was able to get up, feeling very seedy and weak, but I gradually got all right again.

About the middle of the month Weaver went for a well-deserved change to Mombasa, and I looked after Magarini in his absence, and what with the cotton-picking, making an extensive coco-nut nursery, deepening wells, and cutting roads, my time was well occupied. It was quite a trouble disposing of the enormous crop of mango fruit. All the trees were loaded with them, and they were so plentiful and cheap everywhere that they hardly repaid the cost of transport to the coast.

I was much interested to learn that the rain-fall during January at Jelori was nearly $3\frac{3}{4}$ inches, Melindi having only half that amount. Undoubtedly the rain-fall along the Sabaki valley *is* heavier.

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MORNING MUSTER, MAGARINI.

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On February 1, Weaver returned from Mombasa all the better and stronger for his fortnight's visit. Shortly afterwards I received important instructions from the Court of Directors in England, directing me to proceed on a new tour of inspection northwards. I accordingly handed over the charge of the whole of the plantations to Weaver, who had proved himself most zealous and hard-working, and had already accomplished wonders at Magarini. A large cotton-shed and drying-ground had been built, a cotton-ginning machine had been got and set up, and a plough had at last arrived—the first used in East Africa. It proved a great saving in labour, and was a source of great interest to the Arab cultivators.[1]

[1] Some notes supplied to me by Mr. Weaver may be of interest as giving an idea of the agricultural operations carried on about this time at the shambas. (See Appendix B.)

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## CHAPTER XVI

### JOURNEY FROM MOMBRUI TO THE TANA RIVER *viâ* GONGONI, MARERENI, AND LAKE KRAWA

My Expedition—The Coast-lands north of Mombrui—Scarcity of Water—Dwarf Palms—Marereni—Changes since my last Visit—An Uncultivated Wilderness—Water-holes—Euphorbias—Back-waters—Simba Hill—Possibilities of Cultivation—Galla Path—Lake Krawa—The Tana Valley—Galla Village—Golbanti.

I BADE good-bye to Weaver, and left for Mombrui to prepare for my expedition, the object of which was to examine the Tana valley and Witu district as well as the more northern coast-lands lying between the island of Lamu and Port Durnford, hitherto unexplored. My party consisted of seventeen porters, a cook, cook-boy, and one askari, all under the leadership of my trusty head-man Dumgu—altogether twenty-two persons.

I started on the morning of February 13, 1893, for Golbanti on the Tana river by way of Gongoni, Marereni, and Lake Krawa. Once Mombrui was left behind the absence of cocoanut and mango trees was very marked. As one passes Gongoni and proceeds northward towards Marereni, the country adjacent to the sea consists of low flat plains with brackish grey soil, intersected with shallow sandy back-waters. Beyond this one comes upon an area of thick low bush, among which numerous umbrella-shaped or flat-topped mimosas and dwarf palms are noticeable; the soil here being light, but good black loam intermixed with sandy particles. This bush-land continues parallel with the sea, skirting the lower sea-flooded levels; and wherever the land rises the bush



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PAY-TIME—MAGARINI PLANTATIONS.

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grows down to the shore, the surface soil in such places being generally of a very sandy nature.

I examined a good portion of this country, and though much of the bush is thin and scattered and the land poor, yet fertile portions do exist. But the scarcity of water is the principal drawback to cultivation. Shallow swamps and pools of rain-water are formed here and there in the wet season, and if wells were sunk in these places it is probable that water might be found. Water is good and abundant at Mombrui at no greater depth than about 6 to 10 feet from the surface. Fundisha, about half-way between Gongoni and Marereni, may be instanced as a case in point. In this place shambas have been opened up for the purpose of growing food for the orchella-weed gatherers who come to Marereni, and here there are springs in the sand, as well as at Marereni itself, within 100 yards of the sea.

I have mentioned a dwarf palm as being common in the adjoining bush, particularly near N'Gomani. This is the *fan palm*, a dwarf variety of the *Hyphæne thebaica*, yielding a strong fibre, and used very extensively by the natives for thatching and mat-making purposes, and also for the mat-bags (makandas) in which all grain produce is packed for export. The palms growing in sandy soil yield the strongest leaf and fibre, and the better quality is always found closer to the sea.

We now arrived at Marereni, the head-quarters of the orchella-weed gatherers, which is situated, as the crow flies, sixteen miles from Gongoni and twenty-two from Mombrui. A great change had taken place here since my first visit in 1891. Then there existed only a small stockade for the protective garrison, and a shed sufficed for the accommodation of the weed-gatherers. Now a small village of thirty huts had arisen to accommodate the increasing number of people—over 200 having come up this season.[1]

Marereni ends what may be described as the settled northern

[1] The opening of the Fundisha shambas doubtlessly helped towards this, as in former years food was scarce and dear, having to be carried up all the way from Mombrui on men's heads—camels being useless owing to the mud of the mangrove swamps and back-waters.

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portion of the Melindi district, and my march northwards to the Witu country now lay, as far as the Tana river, through entirely uncultivated and unproductive land. Next day, February 14, I started at 5.30 a.m., my first proposed halt being Lake Krawa, fifteen miles to the north-west of Marereni.

The sandy nature of the soil only extends inland for a width of about 300 yards, after which you emerge once more upon the grey loamy soil of the bush. Immediately after leaving the sea-shore the country is open—grass glades and scattered low bush. This being the hot season, the country presented a bare and dried-up appearance, as many of the bush-trees, being deciduous, were now leafless.

Half-an-hour after leaving Marereni I came upon a small swamp, which, though flooded in wet weather, was now dry. These places, though called "swamps," show no sign whatever of dried-up mud; on the contrary, the bottom is quite level and usually carpeted with a growth of fresh green grass, a marked contrast to their burnt-up surroundings.

Half-an-hour beyond this, and about three miles from Marereni, a second swamp or water-hole was passed, with character similar to the first. Large euphorbias were now noticeable in the bush, and the appearance of the country improved, the bush becoming thicker and the trees growing closer together—the former chiefly thorny in character, and containing many mimosas with spear-pointed seeds. After passing the first swamp the soil became very sandy (white sand), and marching was heavy work.

At 6.50, an hour and twenty minutes after my departure from Marereni, I came upon a third and larger swamp, which remains filled with water till the end of December, and water still lay in a hole 2 feet from the surface. The area of this swamp was large, probably 150 by 50 yards.

Want of water being the great drawback to the settlement of this portion of the country, it struck me that sinking wells to ascertain whether a permanent supply was obtainable, was an experiment well worth attempting.

The lay of the land here is very flat, with fairly thick bush and open grass spaces. Further on, after crossing a large open plain all grass (now dry), with scattered clumps of

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EAST AFRICAN CAMELS.

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fan palms, and a soil of black to grey loam, the path emerged suddenly upon a flat, shallow back-water: this was about 4¾ miles from Marereni. Half a mile beyond, the way led through bush again, with a sandy soil: then across open grass-land and scattered bush, the soil being grey to light brown loam, and very friable. We now crossed a succession of open flat back-waters, with a white sandy soil, fringed sea-wards by mangroves—the land side being also sandy. Then bush again, chiefly open, but thicker inland, the soil a sandy grey loam.

Some distance further on I observed two tamarind trees, low and bushy, and bearing a good crop of fruit. These two trees were growing on the edge of bush, which consisted chiefly of mimosa scrub; there were also a good many fan palms. About nine miles from Marereni I came upon an extensive mangrove swamp, some of the trees being very fine, and the tide being up we had to wade through it. The soil was rich, black, oozy mud. The path soon afterwards crossed a second back-water similar to the first, opening out into a wide sandy flat, bounded on the land side by a sandy hillock known locally as "Simba Hill" (Lion Hill), and beyond was a flat low plain covered with bush and grass.

The back-waters I have spoken of must be the continuation of the large creek marked on the map as lying north of Ras Kitua; I could find no trace of either the river Daga, said to empty itself into this creek, or of the village of Jalicha, supposed to be situated about three miles inland from it. From Simba Hill the path inclined more westward through flat bush-land, in which umbrella-shaped mimosas predominated; the soil was a white to grey sandy loam. As one continued, the country presented the same characteristics of low bush with open grass glades, scattered mimosas, and here and there a few *Hyphæne thebaica* palms, up to Lake Krawa.

The bush country which lies westward of Lake Krawa extends for a considerable distance inland, and presents the same characteristics as the country traversed in coming here the soil being generally either white sandy or brown loam, the subsoil the same, and very friable. Clumps of aloes

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(*Sansevieria Kirkii*) are noticeable here and there. The average length of leaf is 1 to 1½ feet, and the greatest length 2 feet; the breadth in the thickest part 6 inches. It is non-serrated, marked by numerous channellings, the front and back of the leaf being much mottled with white markings and the base much incurved. The colour is dull green with distinct brown edgings. I remarked that these *Sansevieria* evidently love shade, clumps of them being always found beneath the shelter of the larger bush-trees.

Before taking leave of this part of the country, I would remark that, although in no way comparable to the more fertile and richer southern districts, I see no reason, provided a permanent water-supply is obtainable, why a large portion of these waste lands should not be brought under remunerative cultivation. The villages marked in this area on older maps show that Galla and other settlements must have once existed, and frequent Masai raids may account for their total disappearance.

The thermometer readings at Krawa on February 14, at 2, 4, and 6 p.m., were 88°, 86°, and 82° in the shade.

My head-man informed me that there existed a path used by the Gallas, from Arbagundi on the Sabaki to Golbanti, which took three days, but it was only used in wet weather, as in the dry season there is no water; this path is a continuation of the caravan route leading from the interior to M'Lengo-Baya, and thence branching off to both Jelori and Takaungu. Evidently it must have been a road well known and frequently used by slave-raiders in former days. The Wa-Galla use it a good deal, travelling up and down at all seasons, going to Makongeni for tobacco, etc. A Galla will accomplish this distance in two days; they have wonderful powers of endurance, and will travel from Golbanti to Mombrui in one day.

At Lake Krawa we camped at the old place on the knoll. The mosquitoes were exceptionally bad that night, and could be heard humming in myriads all round. I got badly bitten even under a mosquito-curtain, but my poor porters, accustomed to them as they were, had no sleep all night, and sat around and almost in the smoke of their fires.

I started for Golbanti at 5 a.m., February 15, the path

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THE FIRST PLOUGH USED ON THE COAST—MAGARINI PLANTATIONS.

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skirting Lake Krawa. Species of aloes grew very numerously about here; besides the *Sansevieria Kirkii*, I also noticed a species with short, sharp-pointed leaves and very thick stems averaging 4 to 5 feet, and in some cases 6 feet. In Swahili this aloe is known as "Kikumbe," in Wanika as "Madango," and in the Galla languages as "Ajiji." The leaves are used for their fibre.

After passing some thorny bush with small scattered open spaces, the soil white sand with a subsoil of brown sandy loam, we continued our way over an open grass plain, passing at short intervals two small water-holes, one of which still contained a little muddy water. There was no vegetation, except grass, on this plain, the soil of which was poor. Seven miles from my last camp I crossed a branch or arm of Lake Krawa, which I had been skirting all along on my right, now and again catching glimpses of its bright green bed. This arm runs up in a N.W. direction, and is about 100 yards in width, covered everywhere with a thick growth of aquatic grasses, though here and there the brown water lay in pools. The soil is black rich clay.

For the next hour we travelled over open plains with short good grass (now all dried up), and scattered, low, round clumps of furzy bush with a small-leaved bright green foliage; and now and then in hollows we came upon dried-up water-pools.

This grass plain, apparently very extensive, is on a decidedly higher level than Lake Krawa, to which it gradually shelves down. With the exception of stunted trees and scattered low bush, it is entirely covered with short grass, and must be a great haunt for game in the wet season. On my way I observed several herds of zebra and antelope.

The surface soil appeared neither fertile nor rich. The plain is undulating, the undulations running north and south. In the various valleys or hollows so formed, the soil is usually a white sandy loam, with more or less bush and frequent dried-up water-pools.

At 10 a.m I came upon an exceptionally deep hollow running from east to west, which evidently drains this portion of the plain, the bottom being a dry swamp about 50 yards broad and covered with green grass; the soil of stiff black



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loam. The plain rises abruptly on the opposite side, and presents the same characteristics as before—to which, however, are now added numerous euphorbias or candelabra trees. This extends in every direction without change to the horizon. The soil at first was a stiff grey clayey loam, but further on became much more friable, and in passing holes made by the rain-water, the subsoil appeared fairly good.

About three miles before reaching the Tana valley, the plain gradually slopes down towards it, as it does also to the eastward. On the right I noticed bright green grass growing on land evidently flooded in the wet season; crossing an end of this the path continued over the plain as before. Then through high aquatic grass, the bed of a shallow lake, now dry, across which could be seen a fringe of Hyphæne or dum palms, and high trees, evidently marking the course of the Tana river. This low-lying swampy ground opens and appears to stretch away to the eastward, with a spot of higher land on which was another fringe of high timber and dum palms.

The path, which had been running due north, here made a sharp bend to the east, skirting the swamp on the right hand, with low bush on the left. Following in this direction for half-an-hour, I came upon a Galla village, with cultivated patches of maize, amongst the high aquatic grass; here the path struck off to the northward, continuing through low-lying swampy ground with the same high aquatic grass (about 3 to 4 feet high), and passing by occasional patches of maize cultivation. The low-lying land I had just passed over is all flooded during the rainy season, and during that period the only communication with Golbanti from Mombrui and southward is by canoe.

Eventually I emerged, somewhat suddenly, upon the Tana river, which here has only grassy banks about 6 feet high, and no fringe of timber. We camped for the night on the outskirts of Golbanti village. It had taken us eight and a half hours from Krawa, following the usual windings of an African path, though the total distance, as the crow flies, is not more than twenty-one miles, while that from Mombrui to Golbanti is about forty-eight miles.

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## CHAPTER XVII

### THE TANA RIVER AND COUNTRY

Golbanti Mission Station—The Wa-Pokomo—Lakes of the Tana Valley—Golbanti and surrounding Country—Lake Ashakababo—Native Method of extracting Aloe Fibre—Luxuriant Maize—Flat Country—The Tana—N'Gao—German Mission—Winding Nature of the River—The Country to the South-west—Lake Burabin—Mr. Bird-Thompson on the Tana and its Tribes.

GOLBANTI (also called Burabin) is a small Galla settlement situated on the Tana river about two and a half miles south of Lake Ashakababo, and twenty miles to the south-west of Witu, and consists of a few conical grass huts. It is also the head-quarters of the Free Methodist Missionary Society, but the two missionaries stationed here were now absent. They have a good stone house, double-storied and iron-roofed, a chapel, the windows of which are strongly barred, and the place surrounded by a wooden palisade. This state of defence was due to the fact that the Masai some few years back had raided as far down as this place, and killed the resident missionary and his wife.[1]

So far I saw but little cultivation, only a few scattered patches of maize amongst the aquatic grass in the dry portion of the lowlands and swamps surrounding the village. The Gallas do not cultivate largely here, but for their subsistence depend more upon their herds of goats; they have no cattle. The chief cultivators appear to be the Wa-Pokomo, a people settled along the banks of the river, of which they are the regular boatmen. Their canoes or "mows," as they are called

[1] In 1895 the station was attacked by the Somalis from the north side of the Tana.



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locally, which they handle with great skill, are the ordinary means of communication from bank to bank, and between the different places situated up and down the Tana river. The Wa-Pokomo are expert fishermen, and hunt the crocodiles with long spears. They have a curious fashion of anointing themselves with a pigment made of red clay, the women especially being noticeable in this respect.

Golbanti may be described as occupying a tongue or point of dry land jutting out to the eastward towards the Tana, and surrounded by low-lying swamps, which are dry in the hot weather but all flooded and under water during the rains. In fact, the lower swamp to the south-west, which I skirted on my way here, is, I understood, connected in the wet season with Lake Krawa, which therefore must then form part of one sheet of water extending up to the Tana itself, a distance of twenty miles.

The first swamp or lake near Golbanti is called in Galla "Ziwah Holechiss" (*i.e.* "tremble" from cold), and is connected in the wet season with the Tana by a natural channel; it is connected also during the rains with Lake Ashakababo, both then forming one sheet of water. Then on the south-west side we have the lake (dry when I was there) extending E.N.E. to the point where it joins the Tana; this lower lake is called Ziwah Burabin (Lake Burabin or Borabin). Ziwah Holechiss joins Lake Burabin, flowing round to the west over the marshy ground traversed by me in coming here, so that for a space of from one to two and a half months Golbanti is entirely surrounded by water. The portion to the westward is very seldom deeper than a man's middle, and can generally be crossed without canoes. There is also a higher spit of land, by which passage can be made between Ziwah Holechiss and Ziwah Ashakababo. The limit of the flooded portion, fully a mile or more wide in places, is well defined by a fringe of timber, dividing it from the higher table-land which extends beyond. Ziwah Burabin extends away to the south-east, where it joins another lake called Ziwah M'Toto; this again is connected with another lake called Gururu, the whole forming, as I have stated, practically one sheet of water from the Tana down to the Kilifi river in the wet season.

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From my camp in Golbanti village, the river Tana lay N.E. and S.E., and Ziwah Holechiss N.N.E., extending round to the N.W. and W.

Immediately round Golbanti, more especially to the westward, the land is very flat, with scattered bush and low dwarf trees; the soil chocolate loam, and the subsoil red marl. A narrow fringe of timber borders the river-banks above Golbanti; but I was struck with the absence of trees round this place, and it is matter for surmise whether the fringe of timber just mentioned, and that defining the limit of flooded land, may not be the remains of a forest, cut down by either the Wa-Galla or Wa-Pokomo. Certainly the solitary trees scattered here and there lend confirmation to this conjecture.

The thermometer at Golbanti at 6 a.m. stood at 74° in the shade.

With a view to seeing the country to the north and north-west of Golbanti, I started in a north-westerly direction, passing through a small Pokomo clearing, the soil of which was a friable chocolate. I skirted Ziwah Holechiss, still partly filled with water, and bordered with a wide stretch of bright green aquatic grass, the Tana flowing on the north and north-east side, while the lake stretched for about a quarter of a mile to the westward. It was edged by the narrow fringe of timber, the probable limit of the wet-season floods, amongst which numerous *Hyphæne thebaica* or dum palms were very noticeable; these, however, did not appear so tall as those growing along the Sabaki river.

I observed in the undergrowth a variety of aloe, of which I noted the following particulars. The flowers, growing on long stalks, 2 to 2½ feet above the plant, are scarlet, with yellow stamens tipped with brown, which extend a quarter to half an inch beyond the calyx, and about one-half to three-quarters of an inch in length. The flowers hang in clusters, bell-shaped, and present somewhat the appearance of a fuchsia. On one cluster I counted fifty-four flowers. The extreme tip of the opening bud is a dark green. The leaves grow on a somewhat long, thick stalk, are spear-shaped or lanceolate, deeply grooved, especially where the leaf closes up to a sharp point with serrated edge (thirty-three spikes, and point hooked

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outwards). The inside of the leaf is a deep red, more accentuated in the mature leaf; the lower side is a light green. The leaf is 2½ feet long by 4½ inches broad.

The above are very numerous in the bush around Golbanti, and are found in thick clumps; the *Sansevieria Kirkii* is also to be found here. The soil is chocolate, friable and good.

Proceeding along the higher spit of level land running between Ziwahs Holechiss and Ashakababo, and bordered by the fringe of timber north of Golbanti, which I mentioned above, I emerged beyond upon the level grass plain which I had travelled over on the way from Krawa, and which stretches far away to the westward—the soil consisting of a grey to whitish somewhat stiff clayey loam. On my right, or the eastern side, I skirted Lake Holechiss, which here ran parallel to the open grass plain by a narrow river-like inlet about 30 to 40 feet wide; aquatic grass growing plentifully on either side in the water, but the centre being clear and deep. Between two and a half and three miles from Golbanti I came upon Lake Ashakababo, a beautiful sheet of water stretching away to the north-west, and bordered on one side by the Tana, which now lay to the north-east. This extensive lake (fully three to four miles long) is the principal one of the chain which here adjoin, and draw their supply from the Tana. The lake is very winding, and narrow flat spits of land project here and there, forming miniature bays and coves. The water is remarkably clear and good, and is generally fringed by a thick border of aquatic grass. A belt of tall trees surrounds the lake, amongst which the dum palm, and a large tree (called in Swahili "munga," pl. "minga") with small acacia-like leaves, predominate. The soil immediately surrounding the lake is a black, stiff clayey loam, becoming light and sandy at the water's edge. A large part of the lake was now dry, and covered with a thick growth of reeds, 3 to 4 feet high, with feathery heads.

I crossed an arm of the lake to the northern bank in a native canoe, and landing at a small Pokomo village close to the shore, I noticed a solitary borassus palm growing near the water's edge, and in the background a large number of dum palms, so numerous as to form quite a grove. Thence I pro-

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ceeded in a N.N.E. direction, keeping the lake on my right and passing through low bush, in which I remarked a great number of "n'konge" aloes (*S. guineensis*), the species which grow so thickly along the Sabaki valley. It is known in Galla as "Omodo." Some Wasania showed me their method of extracting the fibre. They first press the lower stem of the leaf upon the ground to open it, and then pull off the outer layers, which, they say, make the strongest rope; these they squeeze through two sticks stuck in the ground close together and held firmly with the hand, thereby removing the pith and loosening the fibre. The inmost layers of all are drawn out into thin strips, and used for fastenings for roofs, etc. The other species of thick-stemmed aloe is also very plentiful.

The soil in the bush was first black sandy loam, and further on grey sandy and very friable. Aloes appear to thrive and grow most plentifully in white to grey sandy loam.

Continuing through the fringe of timber (chiefly dum palms) skirting the lake, and now and then passing through a Galla village, I examined the soil further on in the dry lake-bed, and found it to consist of black, rich, stiff chocolate loam. Eventually striking off to the right across the dry lake-bed in order to get to the Tana river beyond, and proceeding towards it in a north-easterly direction, I emerged upon land that at one time must have been forest, and was now covered with scattered bush. On my way across the lake-bed I passed some exceedingly fine maize, some of it must have been fully 9 feet high; I understood that the Wa-Pokomo obtained three crops of maize in the year. Here I struck the river-bank, having described a large semicircle since leaving Golbanti, and skirted round Lake Ashakababo, which I crossed at its extreme south-western end.

The Tana here flows through very flat country, the northern bank, I believe, presenting the same characteristics as this, but being hidden by high grass. The banks averaged 5 to 6 feet in height.

I obtained a canoe and descended the river to N'Gao, about twenty-five minutes distant by water. N'Gao is a large Pokomo village; here a German Mission had been established for some years. It had originally settled on the north bank,

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but had been obliged by the floods to move to this side. The cultivation round here consisted of millet, maize, rice, bananas, plantains, beans, etc., but, owing to the frequent raids made by the Witu people, it was not extensive.

At the time of my visit three European missionaries (one married) were residing here, one of them having been over four years in the place; their general appearance was healthy and robust, and spoke well for the salubrity of the locality. Their present houses were only temporary ones, consisting of a dwelling-house and a school; the windows were protected by wire gauze on account of the swarms of mosquitoes that infest the river-banks. The mission is entirely for the Wa-Pokomo, and the missionaries spoke most favourably of the gentle manners of this tribe. There were seven scholars in the school when I visited it; who were occupied in transcribing English letters into copy-books. They were to be taught to read and write. At first very great difficulty was encountered in getting boys to come, as the report had got abroad that they were to be sent to Europe as slaves. Many years of oppression by the Wa-Galla and Swahilis have rendered these people very suspicious and timid.

The missionaries courteously took me to a small hill about 100 feet high and about a quarter of a mile from N'Gao, where they proposed building their permanent residence. They had cut a fine road to the place, 12 feet wide, which they intended eventually to continue to Lake Ashakababo, about one and a half miles to the south-west of N'Gao. This road was cut through the first bit of forest that I had yet seen on this side of the Tana river; the soil was everywhere excellent—a chocolate friable sandy loam. On the top of the small hill they had cut a hole 9 feet deep in the unsuccessful endeavour to find clay for making bricks; the whole depth of the 9 feet consisted entirely of a rich friable red, stone-less loam, a fact which speaks wonders for the depth and richness of the soil.

Divided from this hill by a narrow wooded valley is a lower hill. On the former a large tree had been converted into an observatory, from which an excellent view could be obtained of the surrounding low country, and on a clear day even of the Witu hills, which are over twenty miles away. The following

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lakes lying close to the Tana river could be clearly discerned—

Lake Ashakababo; the extreme southern point of it bearing S.W. from here.

Lake Kongola, W.S.W. This communicates with Ashakababo by a narrow deep channel situated just above the small village of Belozo or Muho, between N'Gao and Golbanti.

Lake Musania, N. by W., on the north bank, and

Lake Semeti, N.N.E., also on the north bank, these two being entirely separate.

I returned to Golbanti by river in a native canoe or "mow." The soil on the river-banks at N'Gao consists chiefly of a grey loamy clay mixed with sand; the subsoil clay, often most consistent and stiff. The river winds greatly; the water has a yellow tinge from the particles of soil in solution which it carries down, and this discolouration is increased after rains. Numerous Pokomo settlements were seen along the river-banks, their cultivation consisting of bananas, plantains, maize, and rice. At intervals there were small fringes of timber along the river; in other places the banks were covered with coarse aquatic grass, and here and there narrow channels or creeks—it was hard to say which as I passed rapidly by in my canoe. The readings of the thermometer on this day and the 18th were as follows—

*In the Shade.*

| February 17. | | February 18. | |
|---|---|---|---|
| 6 a.m. | 74° | 6 a.m. | 68° |
| 10 a.m. | 84° | 10 a.m. | 88° |
| 2 p.m. | 85° | 2 p.m. | 89° |
| 6 p.m. | 79° | 6 p.m. | 79° |

On February 18th I left camp at 7.30 a.m., proceeding down the Tana to visit the country lying to the south-west of Golbanti. The banks of the river are covered with high aquatic grass, and there was a small channel or outlet from the river on the northern bank, nearly opposite Golbanti. The soil of the bank varies, being generally clay, in some places intermixed with grey loam; the subsoil mostly black stiff clay, as a rule tinged with red.

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Further down the banks were low and grassy, with an occasional fringe of low bush, the soil consisting of clay in layers or strata, evidently built up by the deposits of the stream in the annual floods; the upper layers being thickly intermixed with sand, forming a grey sandy to clayey soil. The average height of the banks was from 4 to 6 feet. On either side the land was very flat, and near the river was covered with high aquatic grass, interspersed with small Pokomo clearings situated close to the banks, and consisting of maize, rice, bananas, and plantains. From its very flat appearance the country on the north side must also be flooded during the rains to a considerable extent.

Passing occasional Pokomo huts and one small village on the south side, I proceeded down the river for five miles, landing on the south bank at the Pokomo village of Bura, which had a background of tall trees intermixed with dum palms. Proceeding along the river-side, and skirting Ziwah Burabin—now a low-lying marsh covered with high aquatic grass, and stretching away to the south-west—I struck across the marsh, passing occasional patches of maize, some of them very luxuriant, and further on a patch of rice. Beyond this I had to wade through water about 4 feet deep, emerging on a stretch of higher land where a good many aloes and varieties of *Sansevieria* were growing. Still skirting Lake Burabin in a south-westerly direction, towards which it opens out—the soil of the marsh being a black to grey loam—I eventually emerged on flat grass land, along which I proceeded till I struck the telegraph-line. This plain was covered with good short grass, and at one period the Wa-Galla used to feed their cattle here; but now they appear to possess none, a fact due in the first place to Masai raids, and secondly to the cattle disease, about which I shall have more to say when I come to my visit to Witu. Hence I struck off due north and returned to camp at Golbanti. Whilst staying with Mr. Bird-Thompson at Witu, he gave me much information about the Tana tribes and the portions of the river that I had not visited; he also most kindly placed his report at my disposal, from which the following notes are taken.

Mr. Bird-Thompson accompanied the expedition of 1891,

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under Captain Dundas, R.N., in the stern-wheel steamer *Kenia*, intended to test the navigability of the Tana.

The water-way was found navigable as far as Korokoro, some 250 miles up, but much impeded by snags or sunken tree-trunks, and so sinuous in its course that only vessels of moderate length could round the numerous bends. The current too, being rapid, flowing at the rate of six miles an hour, would necessitate engines of adequate power to make head against it; but with these conditions fulfilled, the Tana is a navigable highway of the greatest value as a factor in the development of the extensive tracts which it drains. The mouth of the Tana, like that of the Juba, is obstructed by an almost impracticable bar.

### NOTES FROM MR. BIRD-THOMPSON'S REPORT.

"We left Mtori (the Tana mouth) at 8.30 a.m. on April 17, 1891, and passed through a beautifully-wooded country, principally mangroves. In this district most of the timber required for dhow-building at Lamu is cut.

"After about three hours' run we came to a small askari station, Mto Tana, on the left bank. It is kept up to provide the Tana mouth with ferrymen, as this is the main road from Lamu to Melindi and Mombasa. About half-an-hour after leaving this station, there is on the right bank, and about an hour's distance from the river, a salt lake from which quantities of salt are obtained by the Chara, Kau, and Witu men, and used for trading purposes in Pokomo.

"As we neared Chara the country became more and more open, ending in flat, open, swampy ground covered with coarse grass about 6 or 7 feet high. At night we anchored a little south of Chara, and the next day, about 10 a.m., we anchored at the boma on the Belazoni Canal, which connects the Tana and Ozi rivers. This canal was made by the Wa-Pokomo, by the orders of the Sultan of Witu, and formerly duty was levied by him on everything passing down the river.

"A good deal of rice cultivation is carried on at Chara. There are also large coco-nut and plantain shambas, with a

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few areca-nut palms. Sweet potatoes and beans are also grown, but not in large quantities, and also a few pineapples and tomatoes. The Chara people are Pokomo, who have adopted Islamism.

"The whole district is admirably adapted for growing rice, and the land can be easily irrigated and cleared.

"It is the same here as higher up, the people say it is not worth their while to cultivate largely owing to the raiding carried on by the Witu people, and which they fear will still continue, and to the 'trading' of the Kau Swahili, who simply take as much as they require and then present the despoiled owners with one or two hoes, sometimes not even that.

"On the 13th we left Belazoni, and passing Chara we came to Chathuro on the right bank, the first Pokomo village on the Tana; and on the 14th reached Golbanti, the Pokomo Mission Station of the Free Methodists; and on the evening of the same day anchored at Ngao, a large Pokomo village on the left bank, where a German Mission Station has been established for some years.

"The inhabitants of Ngao cultivate rice, millet, Indian corn, beans, and plantains, but, as at Chara, little more than is actually required for their own wants. Ngao is only six hours from Witu, and has already been heavily raided by Witu men; it is also only two days' journey off the Kau Swahilis, who call all the Wa-Pokomo as far as Ndera their slaves, and take whatever they want from them.

"When a Swahili wants rice, he goes to a Pokomo village, and, sitting down by a hut, gun in hand, tells a Pokomo to cut him as much rice as he requires, and afterwards makes him row him back to his house.

"The Pokomos of the Lower Tana have no idea of making any resistance, having been accustomed to submit passively for generations, although at the same time complaining bitterly and asking for protection. If properly protected, rice would be largely grown by them.

"On the 23rd we reached Merifano. Very little cultivation is done here, as the river's banks are high and dry, and unsuitable for rice crops; the country all round is fine open grass land, admirably adapted for cattle grazing.

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"On the 27th we reached Ngatana, a large Pokomo village on the left bank. Great quantities of plantains and sugar-cane are grown here, a little rice, and plenty of millet, Indian corn, sweet potatoes, beans, and papaws. On the 28th we reached Kulesa—where there was till recently a Swedish Mission Station, which was burnt during the late Witu disturbances—another great rice and plantain district. The village is on the left bank, but nearly all the plantations are on the right one.

"On the 29th we reached Mwina, the last of the Pokomo villages over which the Swahilis claim authority. Between Mitole and Mwina the banks of the river are lined nearly the whole way with plantains and sugar-cane plantations. Quantities of rice are grown, and at the present time the Pokomos are busily engaged in clearing more ground, and in banking up the river in places where too much water would be likely to damage the crops. Mwina itself is a great plantain district, but the Witu people have recently burned a good many of the shambas. With this village end what are called the South Tana Pokomos, and any one wanting to go by canoe higher up the river must engage men here. The men of Ndera, the next village, are far different from their South Tana brethren; the Swahilis do not dare to raid on them; they have several times successfully resisted attacks from the Somalis. The South Tana Pokomos were until quite recently in a state of absolute slavery to the Swahilis and Gallas, and even now there is much room for improvement in their condition. Although as a rule a fine powerful race of men, they have no idea of resistance, and, having been accustomed to this slavery for generations, they look on it as 'fate.'

"The Pokomos are very affectionate in their private relations. A Pokomo has no concubines, and only one wife, from whom he cannot be separated until her death.

"If the man dies first, the wife is kept by his brother until she chooses to re-marry. They are a gentle, kindly people, always ready to do anything if properly treated, very truthful and honest if left to themselves, but under the fear of pain or death just the opposite.

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"Their villages are all built on the river-banks, the huts beehive in shape, and made of grass on a framework of laths, with raised floors, as the villages are nearly all flooded when the river rises. The Pokomos are a branch of the Wanika, and much like them in appearance. They wear beads and brass-wire ornaments, and a small cloth round their loins, and stain themselves with oil and red brick-dust. They are of a light brown colour, and have pleasant, good-natured faces. Each district is governed by a chief, assisted by a council of the oldest men of the tribe. They are all excellent canoe-men and swimmers, and spend a good deal of their time hunting hippo and crocodiles—in fact, no Pokomo is considered to have proved himself a man until he has killed at least one of them. They hunt with spears having handles from 8 to 10 feet long. In cultivating, rough hoes and knives are used. The Wa-Pokomo number about 10,000 souls, living in 200 villages along the river-bank.

"*May* 1.—We reached Ndera (about four marches from Witu), one of the largest Pokomo villages on the Tana. The people are darker-coloured than those further south, and seem to have intermarried with other tribes, probably with the 'runaway' settlement, which is quite near. They are armed with bows and arrows. The country around is much more wooded than lower down the river, and is a great canoe-manufacturing district. In these woods indiarubber is plentiful, and wild coffee fairly so, but the inhabitants know nothing about the cultivation of either, and do not even know the wild coffee by sight. Rice and plantains are cultivated in large quantities and ivory too is to be had. From Ndera to Nguano (big crocodiles), the next large village, rice, millet, and Indian corn are largely cultivated. The villages in this district are all built in the midst of impenetrable jungle, the paths on either side ending at the river about a quarter of a mile or so distant, consequently if strangers want to go to the villages they have to hail a canoe, and at times one's patience is severely tried. The villages are built in these inaccessible places on account of the Somalis, who constantly raid the district in order to get slaves. As it is, the villages themselves are comparatively safe. The *modus operandi* of

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the Somalis is accordingly adapted to the circumstances. Instead of venturing to attack a village, the raiding band (five or six men generally) secrete themselves in a wood near a shamba, and one of them climbs a tree to reconnoitre. Having ascertained the position of the shambas, the number of Pokomos at work, the hour they commence, and the paths by which they come, the party lie hidden close to the path and wait until the Pokomo they have decided on capturing has passed, laid aside his spear, and commenced work. They then crawl up and get between the man and his spear, and then suddenly rush upon him with wild shouts and cries. The affair is soon over; being no match for a Somali in speed, the victim is either quickly overtaken, made prisoner, and carried off as a slave, or, if he makes resistance, killed at once. At this very town (Nguano) the Pokomos had made 'medicine' to keep off the Somalis, consisting of a little open shed about 1 foot high and 2 feet square, with an ordinary black bottle buried up to the neck in the centre. This, they said, was sure to keep the Somalis away.

"Between Nguano and Kinakombe plantains are cultivated in enormous quantities, also sugar-cane, sweet potatoes, cassava, two sorts of beans, pumpkins, water-melons, tobacco, rice, and Indian corn. The Pokomos are all great snuff-takers, but do not smoke. This, too, is the beginning of the great honey district. Pokomos do not care about eating honey, but make an intoxicating drink from it called *tembo la asali*, which they are very fond of, and drink in large quantities.

"The country at the back of the Kinakombe shambas is mostly open grass land and admirably adapted for cattle grazing, but neither Gallas nor Pokomos dare keep them on account of the raids made by the Somalis and Masai. Nearer the river-banks a great deal of mimosa and cactus scrub is met with.

"Near Kinakombe we came across a village of the Wa-Boni, a wandering tribe who get their living by hunting, and who acknowledge the Gallas as their masters. They are light, wiry-looking people, with rather woolly hair, and of a darkish copper colour, and by no means bad-looking, having little or none of

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the negro type of feature about them. They are undoubtedly of Galla origin, and speak the same language, and although intermarrying with other tribes, have not yet lost all the distinctive characteristics of the true Galla. They live in very small roughly-made, grass bee-hive-shaped huts, and only remain in a place as long as there is game: as the game move they move. Bows and poisoned arrows are their weapons. The poison is very deadly, and a buffalo will fall dead within a few hundred yards of where it has been wounded. Each arrow-head has the owner's special mark upon it, and it is so made that when shot into an animal, the head remains buried in the flesh while the shaft drops to the ground. The reason arrow-heads are marked is, that large game such as elephants, etc., do not die at once, but wander perhaps for days—when dead the arrow-mark is recognized, and the game is handed over to its true owner.

"The Wa-Boni are the great elephant hunters of the Tana district, and almost all the ivory brought from there has been originally obtained by them.

"From Kinakombe up to Kidoni—the last village on the Tana where the pure Pokomo is found—rice is abundantly cultivated round all the villages, whilst the uncultivated spots are covered with dense jungle; behind which, and further away from the river, is a vast extent of open country, in some places thickly and in others thinly covered with mimosa scrub.

"After leaving Kidoni we passed for two and a half days through the Mamole district, a country inhabited by the Wasania. No signs of cultivation were to be seen, but occasionally small huts evidently just deserted. These people are just the same in habits and appearance as the Wa-Boni, and are probably one and the same race. If one of them wants to get married, he has to get leave from the chief Galla of his district, and also to give him a present of one tusk of ivory.

"*June* 22.—We reached the Korokoro district. The country being much more open in appearance, on the 23rd several small plantain shambas were passed, while the trees were much larger and finer than any we had hitherto seen.

"As we neared Oda-boro-rova, the scenery was very lovely.

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On the 25th we came to the first Galla village we have seen in this district. No rice is grown in the Korokoro district, but a fair quantity of Indian corn and beans, some plantains and sugar-cane. From Korokoro to Hameye, the last inhabited village on the Tana, no cultivation is carried on on the south bank, partly from fear of the Wa-Kamba, who are constantly raiding the people, and partly on account of the dense jungle.

"The people who inhabit the river-banks in this district call themselves Walorokoro. They are darker in appearance than the pure Pokomo, and are probably a mixed race of Pokomos and Wa-Boni, as they have some of the characteristics of both, viz. the Pokomo's love of the river and timid nature, and the Wa-Boni's love of hunting and skill in using the bow and arrow.

"The river between Korokoro and Hameye is dotted with numerous islands, and it is on these that the inhabitants grow the principal part of their Indian corn and plantains, but in no large quantities.

"It is here that one sees the first signs of stone in the Tana district, viz. fine gravel near Korokoro, and round Hameye big slabs of stone. The soil from the coast up is sandy in the 'bars,' and black rich-looking earth near the river-banks, where the chief cultivation is carried on. From Bilati, where we built our boma, to Hameye, the country is completely burnt up by the heat; not a speck of green grass is visible, and even the thorn scrub has a withered, dead look. The natives here exchange provisions for beads, cloth, and *ngeo* (a kind of red brick-dust). If a Galla woman's first child is a female, it is taken away into the woods and there left to die. When a Galla kills his first man, he cuts off the head and brings it home to his village as a proof, and henceforth wears an ivory ring on the right arm, above the elbow, to show that he has proved himself a man.

"When a man dies he is buried close to his cattle-shed, as that is considered the place of honour, and it is there that all the councils are held. Each district is governed by a Sultan or chief, who is elected by the chief men, but when once elected, the office becomes hereditary. Their marriage



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customs are the same as those of the Wa-Boni; the woman has no say in the matter. The man who wishes to marry a woman, asks leave of her father, giving him a present of cattle, honey, and tobacco. For ornaments they wear bangles and necklaces of brass, tin, and very small ear-rings; the men when fighting at close quarters wear a large brass or iron ring with two sharp edges (a kind of knuckle-duster); it is used for striking downwards.

"They are very fond of an intoxicating drink made from honey; they are also great tobacco-chewers, the same plug will last them for one or two days. After having chewed a little, they take it out of the mouth and place it behind the ear, like a pen, where it is carried until again required. Very little grain is consumed, flesh and milk being their chief food."

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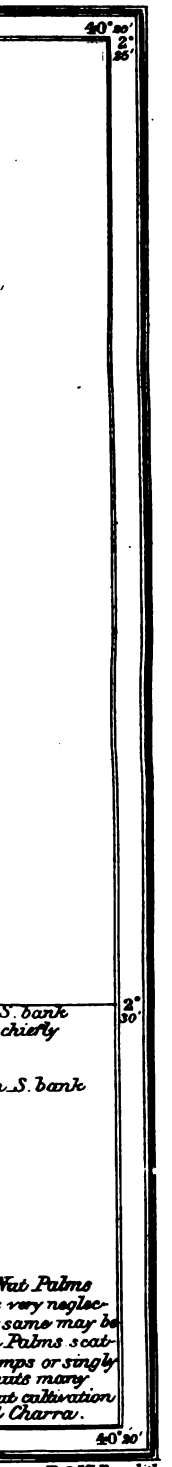


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## CHAPTER XVIII

### GOLBANTI TO WITU

Journey down the River—The Belesoni Canal—The Tana Swamps—Kalota River—Kisanga Wells—The Ozi River—Kau—Camping in a Graveyard—Crocodiles—Kirimanda River—"M'To Mombamba"—March to Witu—European Officers at Witu—The Rebel Sultan—Salt Lake—The Cattle Disease—A Loyal Native Gentleman—The Witu Country.

I LEFT Golbanti on February 20 for Kau, proceeding down the river in a large dhow, which carried me and all my belongings. Progress was very slow: it took a good eight hours to reach the Belesoni canal, stated to be fourteen miles distant from Golbanti, which connects the Tana and the Ozi rivers.

"The Belesoni (or M'Beledzoni) canal varies from 4 to 7 feet in width. The banks are entirely covered with high grass, and the depth varies according to the state of the Tana, from a few inches to several feet.

"From Captain Dundas's observations, it would appear that at one time the Ozi and Tana mouths were outlets for one large river, the area between them being a sort of alluvial delta. During an overflow of the Tana, the Ozi even now carries off a large quantity of its water, owing to the country north-west of the Belesoni being flooded. In the heavy rains the current of the Tana is so strong that it drives the tide back in the Ozi, rendering the water quite drinkable as far as Kau, the supply for which place in the dry season has to be obtained from wells."[1]

My way from the banks of the Tana led along the left

[1] See 'Exploration of the Tana,' by Captain Dundas, *Proceedings of the Royal Geographical Society*, August 1892.



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bank of the Belesoni canal in a N.N.E. direction. The country by the canal is covered in every direction, as far as can be seen, with a rank growth of high aquatic grass 6 feet high, on a black, tenacious clay soil, very slippery, and in places cracked into deep fissures by the heat. This soil is of great depth, as is shown by the banks of the canal, which were fully 4 to 5 and sometimes 6 feet above the water. The canal was, at the time of my visit, nearly dry, and was impassable for "mows" or canoes.

After proceeding for an hour along the banks of the canal, I crossed over to the other side, and almost immediately lost the small foot-track we were following. It was quite overgrown by the thick high grass of the alluvial plain through which we were still proceeding, now and then having to wade through swampy hollows, also covered with grass. We emerged eventually upon a dry tongue of land, forming an island above the general level, and covered with prickly dwarf mimosas (seeds, white, with spur) and some *Hyphæne thebaica* or dum palms.

Beyond this we passed through another swamp also covered with high aquatic grass and surrounded by numerous Hyphæne palms; continuing over an open grass plain (the soil of which was very black friable loam intermixed with roots and resembling peat), we waded through more swamps, and after much difficulty, occasioned by constantly losing the narrow overgrown track, we emerged once more on the plain, covered with the same growth of aquatic grass, and fringed on all sides with rows of tall Hyphæne palms, the soil being still of black clay.

Proceeding in a north-easterly direction we crossed a narrow swampy river, the bed being filled with a dense growth of thick aquatic grass and reeds, and fairly deep—the water coming up to my middle and shoulders. This is the Kalota river, which takes its rise in the Tana swamps, and flows from north-west eastward. On the opposite side stretched the same low plain, and after crossing another swamp—three hours from the Tana—we eventually arrived at M'Tomoni shambas, lying in a north-easterly direction from the river, and the first sign of cultivation on this side of it.

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These shambas are called in full, M'Tomoni cum Wegne Akombo, and consist of a small area planted with coco-nuts and bananas, and a little ground cultivation—maize and beans and a few bushes of capsicum pepper (with large yellow pods). The shambas are situated on a point of land of a higher level running out into the lower swampy alluvial flats just traversed. The soil was grey sandy loam. The whole of the alluvial plain referred to is completely under water during the wet season, a boat or canoe being necessary to cross it.

Continuing through the shambas, still in a north-easterly direction, and passing some baobabs, I arrived at the small village of M'Tomoni, stated to be at one and a half hours' distance—or roughly four and a half to five miles—from Kau. Leaving M'Tomoni, we descended once more on to the continuation of the low plains just traversed, and surrounded, especially on the east and south-east, by a thick fringe of Hyphæne palms. The soil of this plain was dark grey clay, and covered with grass. The plain narrowing as I proceeded, and still fringed on all sides as described, I arrived upon a second small cultivated area called Kisanga, this too comprising coco-nuts and mango trees, and some ground cultivation. The soil here was light sandy grey loam.

Kisanga is chiefly noted for possessing good water wells, and it is on these wells that the people of Kau depend for their chief supply during the hot or dry season. Kisanga is surrounded on the north-east side by low bush, and on the west by the low-lying plains.

Proceeding through Kisanga, I again entered on flat land, at present covered with short green grass; the soil black to dark grey clayey loam. I continued in a north-east by east direction, passing through a pool of fresh water, and across a similar grassy plain with patches of bush, and fringed with the same north and south. This plain was evidently subject to floods; it became more and more swampy until, after dark, I found myself marching through thick mangroves, mud and water, and brackish pools, having latterly the Ozi river on my left. At 7.30 p.m. I reached that river, which I crossed in the ferry boat—hippopotami snorting round us—and arrived at Kau. Passing through the town, I camped outside it at 8 p.m.

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near a pool of water, and in the morning discovered that I was in the middle of the town graveyard, and the pool we had been drinking from was where the people washed themselves and their clothes! This had been a very fatiguing march, and I had had nothing to eat but a few biscuits since leaving Golbanti at 6 a.m.

The thermometer at Kau next day (February 21) at 6 and 10 a.m., 12 noon, and 2 p.m., stood respectively at 70°, 86°, 87°, and 87° in the shade.

I annex a sketch-map giving the position of Kau, which may be useful for present reference. As will be seen, the town of Kau is situated on what may be described as an island, formed by the river Ozi on one side and its tributary rivers and creeks on the other; and its communication with the Tana river through the Belesoni canal gives it considerable commercial advantages, enabling it to command the greater portion of the traffic descending the Tana. Kau was formerly a Pokomo settlement, but the Pokomos were driven away by the Swahilis, who then occupied the town; and as long as the raiding and plundering of the unfortunate Pokomos was unchecked the place continued to be of considerable importance—the Sultan of Witu also levying customs dues on all traffic passing up and down the Tana river until driven back to his own territory by the British East Africa Company. But times are now changed, the advent of civilized influence and authority have put an end to an importance derived chiefly from illegality and oppression, and Kau does not now comprise more than about 300 inhabitants. It possesses a substantial stone-built fort, erected in a position to command the water approaches of the town.

Comparatively little trading with the Pokomos is now carried on, and at the period of my visit there were only two Indian traders' shops to be found in the town. Cultivation has also greatly decreased, a Swahili being no longer able to coerce a Pokomo (previously regarded and treated as his natural slave) to labour for him as before. Consequently the cultivated area has greatly decreased, and the people of Kau, possessing but few slaves, are obliged to work in their fields themselves. Thus it was only the easily accessible portions of

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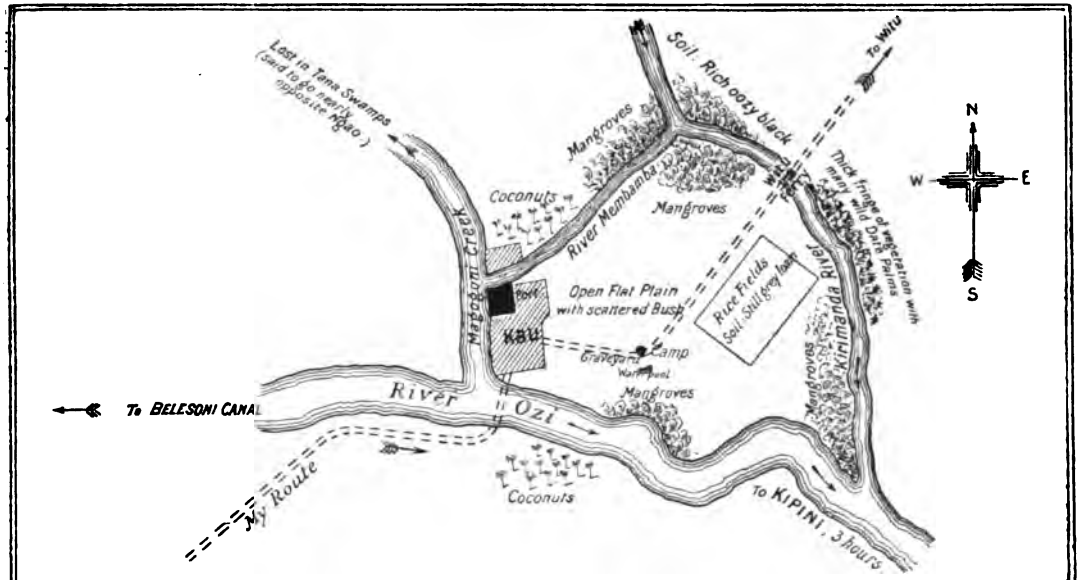


**Rough Sketch Map of KAU & its surroundings.**

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the Tana—as, for example, Chara—that were cultivated, and even these, I observed on my journey down the river, showed unmistakable signs of neglect.

I was informed that in the year 1889 the Wa-Galla owned from 200 to 300 head of cattle on the swampy grass plains near Kau, where they had a small village called, I believe, Kitumbini; but all the cattle were destroyed by the disease.

The Ozi is a tidal river, the tide running up to Kau, and, in the north-east monsoon, fully six to eight miles beyond the town. In the south-west monsoon, for the reason already referred to, the tide is driven back by the Tana flood, and the water is fresh. During the dry season fresh water has often to be obtained from the wells at Kisanga, which I passed on my way here.

I observed with interest some coco-nuts growing on the south bank of the Ozi, and looking very robust and luxuriant. These were the first I saw on the mainland actually growing in salt or brackish water; I noticed others growing amongst the oozy mud on the banks of the small channel to the north of the town.

The great importance which I attach to the question of utilizing the extensive areas formed by mangrove swamps, by planting them with coco-nuts, and so transforming these malarious swamps and wastes into fertile and prosperous plantations, makes me welcome this opportunity of again drawing attention to the subject. I have already quoted competent authority as to the suitability of such localities for coco-nut cultivation, and I had personal evidence of the fact in Zanzibar Island, where, at Kokotoni, I was much interested in the healthy and vigorous appearance of coco-nut trees growing on the margin of a river along which the sea-water tide was felt.

The Kau people possessed other coco-nut plantations at Kipini, which will be referred to later on.

Hippopotami and crocodiles are numerous in the Ozi river; the latter particularly are so fierce that at one time a palisade had to be put down in the river for protection at the spot where women and children went to draw water, so many

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unfortunate victims had been seized and dragged off by these brutes.

I started for Witu in the afternoon of February 21, going in a north-easterly direction, and noticing on my right some small rice-fields, enclosed by mud walls to retain the water—the soil was of a stiff grey loam. Turning to the north, I soon came upon the Kirimanda river, a small stream flowing into the Ozi to the south-east of Kau, and also connected with the latter by a small stream, M'To Mombamba, to the W.N.W., which rises in the low swampy plain to the north of the town. The Kirimanda is also tidal (through the Ozi), and where I crossed it the water was salt. The river is fringed with a thick rank growth of vegetation, amongst which many wild date palms were noticeable. The soil was of the richest black oozy mud, and should do exceedingly well for coco-nut cultivation.

Here there was a small ferry to Witu, comprising two canoes, and it took me three-quarters of an hour to get my porters and loads across—the men sinking up to their knees in the deep mud. The path after this skirted the Kirimanda river through mangrove swamps, and here and there brackish pools (the mangroves being fine trees), with occasional open patches of short green grass. Hippo tracks were very numerous. Then succeeded an open grass plain with scattered patches of bush, the soil being dark grey to black loamy clay, with occasional patches of white sand.

The country between Kau and the town of Witu—a distance of ten miles—as well as that extending in a south-easterly direction to Kipini, and in the opposite direction to N'Gao, may be briefly described as a low, flat, swampy plain, evidently subject to periodic floods. One portion of it contains a swampy salt-water channel, which my guide told me was flooded in the rains with fresh water. Mangroves, Hyphæne palms, acacias, and baobabs alternate with open grass, the soil being generally a grey loam.

The latter part of the distance, during which the soil—a sandy grey loam—may be described as excellent, was through cultivated land, beans, maize, scattered mango trees, and a small coco-nut plantation, being met with before we arrived at Witu.

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I took up my quarters here with Mr. Bird-Thompson and Dr. Rae, the Company's officers then in charge of the district, from whom I received the greatest assistance and courtesy during my stay. Both these gentlemen, I regret to say, have since died.

I was laid up here for four days by illness, most probably caused by drinking the graveyard water at Kau! There was some excitement in the town just then. One of the men of Fumo Omari (the rebel "Sultan" of Witu), who had been causing a good deal of disturbance lately by slave-stealing and troubling the Pokomos on the Tana, had been arrested and imprisoned in Lamu by Capt. Rogers, the Company's Commandant. Fumo Omari had threatened war if the man was not released, and the Company's Indian police (about 100 strong) were held in readiness to guard against an attack.

Witu is situated on a low ridge, and is entirely surrounded by an oval belt of forest. The town is traversed by wide straight roads, available in cases of emergency for sweeping the approaches to the town. The water supply was abundant and good, and was obtained chiefly from the old wells which had recently been cleaned out; some of it was slightly brackish in taste. Stone and coral rock are plentiful, and lime can be made in any quantity from the latter. There is a small river about fifteen minutes' walk to the east of the town, flowing from the north and eventually losing itself to the south-east. During seven months of the year it is quite dry, and the dry bed is clearly defined, but when full in the rainy season, a boat is required to cross it.

Another noticeable feature, and one of great local importance, is a small salt lake, situated to the south of the town. In the rainy season it is filled with salt water, but during the dry season its bed is covered with a thick white incrustation of salt which renews itself as often as removed. This natural salt is of remarkable whiteness, and crystallizes into masses of such hardness that it has to be broken with native axes. The salt forms a great article of trade with the Pokomos on the Tana, and any one gathering it from the lake can at any time exchange it in the town for provisions.

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A laudable attempt had been made some time back by the Company to introduce wheeled traffic into the district, and with this object sixteen bullock hackeries had been sent up, and thirty or forty Indian bullocks. The former seemed to me to be much too heavy, and something on the same principle, but much lighter, and suitable for one bullock—like the light Ceylon hackeries—struck me as being better adapted for the purpose. Unfortunately the experiment perished at its inception through the death of all the bullocks from the cattle disease. This plague had swept the country from Abyssinia to the Equatorial Lakes, destroying not only cattle, but herds of buffaloes, deer, etc. etc., till the whole region was strewn with skeletons. It has since then, as every one knows, made its way southwards nearly to the Cape, where it has not only devastated herds, but brought about political troubles.[1] As to the character and extent of the epidemic, the following extracts from Captain Lugard's

[1] Long after the above lines were written, Mr. F. C. Selous delivered an address before the Geographical section of the British Association at Toronto, Canada, on *The Economic Geography of Rhodesia*, which was published in *The Times* of August 25, 1897, from which I quote the following extract—

"At present there are practically no cattle in Rhodesia. The rinderpest last year swept every herd in the country off the face of the earth. But that scourge has passed, and is not likely ever to occur again, and in course of time the whole country will be re-stocked. That Matabeleland is a good cattle country no one can deny who remembers the innumerable herds which covered the land in Lobengula's time, and I can testify from my own experience that all the high plateau lands of Rhodesia are equally suitable for horned cattle. . . . As far as I have been able to learn from the natives, the cattle indigenous to Rhodesia were very free from disease. The lung sickness (pleuro-pneumonia) originally introduced into South Africa from Holland, spread to Matabeleland in 1854, but was unknown in Mashonaland until 1890, when it accompanied the pioneer expedition to that country. The effects of this disease are most disastrous amongst a herd of uninoculated cattle, but if the year's calves are inoculated regularly every year, as is the practice of all careful farmers in South Africa, there is but little to be feared from it, and it is now most virulent amongst the cattle of natives who do not practise inoculation. Besides lung sickness there is no other disease at all prevalent amongst cattle in Rhodesia, as far as I know. A few die annually from gall sickness, which is apparently produced by the richness of the grass, as cattle are always very fat when they die of this disease."

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work on Eastern Africa[1] will give all the information here necessary. Concerning the course of the plague, he says—

"The plague seems to have started on the east coast, opposite Aden, and to have spread inland. It began at the end of 1889, and when I went into the interior in the December of that year it had not reached Masailand and Ukamba, nor yet in the spring of 1890. When I returned up-country in the autumn of 1890 it had spread through these countries, and the cattle and buffaloes were dead. It had preceded me through Kavirondo and Uganda, though when Mr. Jackson passed down in the summer of 1890, it was only beginning to show its effects. Beyond Uganda I found it had just preceded me through Ankoli and Unyoro; and in the far heart of Africa, at Kavalli, it had swept off every ox only a few weeks before I arrived (Sept. 1891). Passing southwards, it reached the north of Nyasa about July 1892, and we may look to hear of its ravages in the north, in the Soudan and Abyssinia, till it reaches the confines of Egypt, and on the west through the Congo State till its area of death has extended from sea to sea."

In another place he writes—

"It is strange that so little is known of the nature of this plague. It has been reported as a kind of anthrax by Dr. Charlesworth at Zanzibar, whilst others (and these apparently the majority) have described it as a lung disease. Dr. Mackinnon and Captain Rogers thus describe it from Witu.

"Mr. Sharpe, from Nyasaland, states the disease there to have been pleuro-pneumonia. The enormous extent of the devastation it has caused in Africa can hardly be exaggerated. Most of the tribes possessed vast herds of thousands on thousands of cattle, and of these, in some localities, hardly one is left; in others, the deaths have been limited to perhaps 90 per cent. In the case of the Bantu (or Negroid) tribes, the loss, though a terrible one, did not, as a rule, involve starvation and death to the people, since being also agricultural, they possess large crops as a resource. But to the pastoral races the loss of their cattle meant death. The Wahuma, I was told, had perished in vast numbers with their animals.

[1] *The Rise of our East African Empire*, by Captain Lugard.

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Everywhere the people I saw were gaunt and half-starved, and covered with skin diseases. Not only had they no crops of any sort or kind to replace the milk and meat which formed their natural diet, but many were unable to accommodate themselves to such a change, and all were completely ignorant of agriculture."

Thus not only did the cattle disappear, but also large numbers of the pastoral tribes, who depended upon cattle alone for food.

The action of the disease is extremely rapid, in three successive stages of violent purging, debility, and death.[1] Emin Pasha ascribed the disease which he found so fatal in Latuka to the scarcity of salt—[2]

"Although the abundance of game is a blessing to the people, I attribute to it a fact which I could not previously explain: all cattle brought here, and riding animals, such as

[1] The symptoms of the great African cattle distemper (which unhappily has not yet quite run its course) are thus given by the Government veterinary surgeon in Rhodesia (Mr. C. E. Gray). I believe that at the time this epidemic was raging on the mainland, frequent cases of anthrax occurred amongst the horses at Zanzibar—

"Extreme depression, arching of the back, disinclination to move, and frequently grinding of the teeth; the eyes appear swollen and very red. There is a discharge of mucus from the eyes, nose, and sometimes from the vagina, with frequently marked dripping of saliva from the mouth. On examination it will be found that sometimes the mucous membrane covering the roof of the mouth is broken in places. These broken places are very much reddened, and occasionally there is a certain amount of redness at the base of the front teeth. These last two features are not, however, invariably present. As the disease progresses diarrhœa generally appears. The discharges are slimy, greenish-yellow in colour, frequently containing flakes of lymph and occasionally bloody; sometimes there is a slight cough. Appetite and rumination are suspended in the later stages, and sometimes twitching of the muscles will be noticed. Pulse weak and rapid; breathing hurried; temperature ranges from 102½° Fahrenheit to 108°. A rise of temperature is one of the early indications of the disease. Duration from twenty-four hours or even less to seven days; average duration five days. The most constant symptoms are the redness and runnings at the eyes and nose and the rise of temperature." (*The Times*, May 27, 1896.)

[2] *Emin Pasha in Central Africa*, p. 223.

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donkeys, mules, etc., are ruined after a short stay. Swelling on different parts of the body, loss of appetite, emaciation, and finally death follow one another speedily, a combination of symptoms which I attribute to the intrusion of intestinal worms. This view is confirmed by the fact that all game absolutely swarms with worms; this is always the case in countries where salt is rare."

I was much struck when at Witu with the appearance and conversation of the late Sultan's Commander-in-Chief, a native gentleman named Omari Madi, a man of great intelligence and highly respected. He had been of the greatest help since the late expedition, and had proved very loyal. He visited Mr. Bird-Thompson twice a day, and although repeatedly offered, had always refused to accept any reward whatever for his services. Formerly he had been one of the largest cultivators in the district, but at present he barely possessed more than ten or twelve slaves, and worked with them himself. I was indebted to him for much valuable information concerning the country.

The open plain surrounding Witu extends for about fifteen miles in a north-easterly direction, broken here and there by scattered woods, the remains of the original forest. Beyond the plain follows forest, reported to be rich in indiarubber of a superior quality. This forest is stated to be very extensive, and to extend in a northerly direction for "many days," Omari Madi informing me that its extent was quite unknown. I was also informed that fertile land, of an excellent quality, extends for two and a half days' march to the north-west; the soil being said to be everywhere equally rich, and generally of a black loamy nature. With the exception of Mulali, where there is a small wood, the country close to Witu is generally covered with mimosas and Hyphæne palms.

Utwani, the indiarubber forest, lies four and a half miles away due east of Witu, the path following the telegraph-line. This forest extends to the lake of M'Pekatoni (about fifteen miles distant) in a south-easterly direction, and about eighteen miles in the opposite or north-westerly direction. It is not very broad—a quarter of an hour's stretch—and roughly the

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forest may be described as a long narrow strip, the telegraph-line to M'Konumbi and Lamu cutting it at right angles.[1]

Utwani lies on the main road from Witu to Lamu, the next place being Pangani, situated about three miles beyond. Hyphæne palms again form a common feature in the landscape, and the soil is a light sandy loam covered with coarse grass. The country is flat, and was reported to be flooded to a depth of 3½ feet during the wet season, the floods lasting on an average two and a half months.

Beyond Pangani lies Fungo Zombo, at a distance of about five and a half miles. About seven miles beyond, or twenty miles from Witu, is M'Konumbi (a sea-creek), the shipping port of Lamu, the country around being flat and open and more or less cultivated.

Jongeni, the head-quarters of the rebel Sultan, Fumo Omari, lay to the north-east of the town of Witu, about twenty-four miles distant. Jongeni was surrounded by stockaded villages situated in the forest, and defended by rifle and sand-pits.

After this general outline, from information supplied to me by Mr. Bird-Thompson and Omari Madi, I will now record my personal observations of the district.

[1] The telegraph-line connects Mombasa with Lamu, *viâ* Melindi, Golbanti, and Witu.

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## CHAPTER XIX

### THE WITU DISTRICT—WITU TO KIPINI

The Utwani Forest—Disturbed State of the Country—The English Expedition of 1890—The Tsetse Fly—Start for Shaga—Lake Chakamba—A German Settler's Cotton Plantation.

BEING desirous of inspecting the forest belt surrounding the town of Witu, I made an excursion thither, Mr. Bird-Thompson and Omari Madi courteously accompanying me.

Going out by the eastern gate, we proceeded in a north-easterly direction over a large open plain, stated by Omari Madi to have been once extensively cultivated, chiefly with rice. On our left we were skirting the forest belt, and on the right we passed some scattered coco-nuts, and numerous Hyphæne palms, as well as a number of straight white-stemmed trees, the timber of which was not used. The soil was excellent, light friable brown loam. Such cultivation as existed was all within a short distance of Witu, fear of Fumo Omari's followers preventing the people from clearing or opening up land at any great distance. Two and a half miles from the town cultivators stopped work in the middle of the day, for as recently as last year three women were killed at a place called Mehanini, south-west from Witu. The last raiding expedition of the Jongeni people had been made against the Pokomos at N'Gatana in the October or November previous to my visit.

Entering a fringe of forest, with a rich and fertile black loamy soil, and composed of large trees with dense undergrowth, we came upon a small swamp, on the forest edge of which a German had had a small tobacco-garden prior to the trouble that had brought on the punitive naval expedition of



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October 1890.[1] Omari Madi, who had seen the tobacco growing, assured me that it was very fine indeed, but he did not think any of the crop had been sold. The soil round this swamp and on the adjacent open grass plain was rich dark loam.

Skirting the forest on the left, we had on the right a plain covered with thick feathery-headed grass about 2 feet high; there were also scattered mimosas and Hyphæne and fan palms. The forest contains fine large timber trees, and extends for about three and a half miles to the north of Witu. It was reported to contain ebony (Swahili, "m'pengo"), and I saw some small specimens here and there along the forest edge. As we proceeded, the grass plain—reported to be flooded during the south-west monsoon, and to have been formerly under extensive rice cultivation—spread away northward and eastward with scattered Hyphæne palms and low bush, the soil being a rich black loam. Of course, at this time the unsettled and insecure state of the country was a complete hindrance to cultivation of any kind.

Still skirting the forest, our direction was now north-west; the plain became more park-like and the country very level, the soil still continuing rich. The fan palms especially were so very numerous, that a profitable use might be made of the leaves and fibre. The leaves were universally used for thatching, and, being heavier, made a better and more lasting roof than cocoa-palm thatch. The natives stated that a roof made of fan-palm leaves lasted seven years; even supposing (making allowance for white ants) the duration to be only five years, the material appears to be wonderfully serviceable. Mats were made on a small scale, and doubtless makandas (mat-bags) could be made in large quantities, if there were a demand for them.

[1] Nine Germans, under the guidance of a Herr Küntzel (who had previously resided in the district), were desirous of setting up saw-mills in the Utwani forest. All but two were ruthlessly shot down as they entered the town of Witu to solicit the Sultan's permission. The British Government having recently taken over the protectorate of Witu from Germany (July 1, 1890), was obliged to despatch a punitive naval expedition to avenge the death of these men, and the town was entered by our Naval Brigade, and the Sultan's palace was blown up. The Sultan (Fumo Omari) was proclaimed an outlaw, and fled into the bush.



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Having now reached the end of the forest belt, we turned round it in a south-westerly direction. The low flat grass plain still continued, extending as far as could be seen to the north-east. I noticed a few clumps of the succulent guinea-grass—an unfailing indication of rich soil—so largely cultivated on Indian and Ceylon plantations for feeding horses and cattle. All the plain on this side was under cultivation, one of Omari Madi's former shambas being close by. I examined the soil of a dry water-hole here to a depth of 4 feet; it was the same black friable sandy loam as previously described. Proceeding next through thick grass, 4 feet high, with some scattered baobabs, the soil in places being a lighter loam, we passed through one or two other old shambas of Omari Madi's, where rice had formerly been cultivated.

Following the curve of the forest belt, and proceeding southward, we came to an open fertile plain, extending away to the westward and formerly under rice and millet. Hyphæne and fan palms were numerous. The former were now only tapped for toddy in a small way—formerly the toddy had been extracted more extensively, the Wa-Galla being very fond of it. A little further on, I passed some fine scattered mango trees. Later, we passed through two low swamps, and after these, came upon an undulating plain, all grass, with scattered baobabs, the soil being still a black friable loam.

Having now come to the lower end of the forest belt, we turned homewards to the north-east, joining at right angles the road I had traversed from Kau, and passing by the fringe of coco-nuts above the salt lake, through a small area of cultivation consisting of coco-nuts, maize, and beans.

Roughly, it had taken three hours to make the circuit of the forest surrounding Witu, and half-an-hour (or perhaps less) to go through it. Beyond this forest stretches on all sides an extensive flat, fertile plain, offering every facility for cultivation on a large scale.

I left Witu on February 28, accompanied by Mr. Bird-Thompson, on a visit to the Utwani forest. The direction taken was due east. About ten minutes' distance we again crossed the dry bed of the small stream. Then the way led

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over a large and slightly undulating open grass plain, with numerous fan palms, large trees and clumps of bush. This plain would very soon revert to bush were it not for the grass being constantly burnt during the dry season. On the far left I observed a strip of Utwani forest, a remnant of the original forest which had evidently at one time covered the whole plain, extending in a north-westerly direction. There were also some scattered mango trees, the relics of former cultivation. The soil was generally of a uniform friable character and dark grey colour. Mr. Bird-Thompson informed me that the greater portion of this country was flooded during the rainy season.

Entering the forest we passed through an open clearing, where in 1889 the Germans had a tobacco plantation, which had been opened up by a certain Herr Toeppen.

The forest to the north-east of Witu (in which the rebel stockades at Jongeni were situated) was reported—with what truth my informant could not say—to extend up to the Juba river, running parallel to the coast, at an average distance from the sea of about thirty miles.

Utwani is a fine forest, of large heavy-timbered trees and thick undergrowth, extending in a north-westerly direction. Its width where the telegraph-line crosses it is about 1600 yards. In the middle lies a swamp. I examined the soil in two places—in one it was rich friable grey loam; in the other, close to the swamp, black stiff loam mixed with sand.

Beyond the forest to the eastward we again find the open grass plain with numerous Hyphæne palms, and these characteristics continue up to Fungo Zombo, some portions being more open, and the soil a light brown sandy loam. The country here is more or less flooded for two months in the year, during the south-west monsoon.

One impediment to the future agricultural development of this part of the country (existing in East Africa, however, to a much less extent than in any other part of the continent) is the presence of the *Tsetse Fly*. A variety of it, and another species, a gadfly, are found in Witu. In the lower coast region, between Mombasa and Uganda, the tsetse fly is said to be localized in a comparatively narrow belt, easily passed during

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the night, and there is no doubt that the destruction of cattle and game during the epidemic considerably lessened the numbers of this insect pest. In Witu, too, the variety known there appears to be confined to a very limited area, chiefly forest, and in which Utwani is included. The Wa-Galla are accustomed to guard against the fly (called locally "Ganda"), when driving their cattle through the forest, by doing so at night, and by lighting large fires, the smoke of which acts as a protection to the cattle.

So little appears to be known about the tsetse fly, that the following information concerning it may prove of interest —"There are several species of these poisonous two-winged

THE TSETSE FLY (*Glossina morsitans*) MAGNIFIED.

ACTUAL SIZE.

flies recorded from various parts of Africa, and the one commonly found in the Shiré highlands is *Glossina morsitans*, much resembling, but rather larger than the common house-fly. Its general colour is dark brown, with lighter markings on the abdomen, and biting proboscis protruding from underneath the head, the antennæ being distinctly pectinated bristles. . . . The buffalo, the zebra, and the large family of antelopes are proof against the poison of the tsetse, and this must have come about by means of inoculation for ages past. It is difficult to conceive that a single bite from such an apparently insignificant fly should prove fatal to large animals, such as horses and cattle, but that they do succumb is an undoubted

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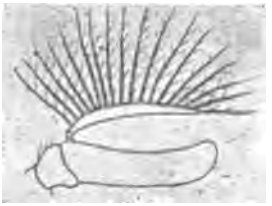
fact. The victim after being bitten falls off in condition, assumes a staring coat, suffers from extreme depression and loss of appetite, and ultimately dies from what may be termed a species of blood-poisoning. In the British Museum are specimens of our common tsetse fly from Benin, the Congo, Witu, and Lake Mweru; other species recorded from the Upper Sabaki river, the Limpopo river, and Somaliland are also there. There is another fly, in this case a gadfly—*Tabanus latipes*, Macq.—the size and shape of a large blue-bottle fly, recorded from Witu, and also from Nyasaland, which is most harassing to cattle and horses. It is a formidable-looking creature, with interrupted brown markings on the wings. It is reported to be a great scourge in East Africa, and draws



MAGNIFIED PROBOSCIS OF TSETSE FLY.

blood so freely as to render cattle weak and unfit for work. The bite is also very painful. There is no mistaking it for the ordinary gadflies, which are longer in the body, and have no bars on the wings. With reference to passing domestic animals rapidly through tsetse-infected districts, it is said that smearing the body of the animal all over with cow manure in a semi-liquid state renders it proof against the bite of the fly. This I can quite believe, as, curious to say, cow-dung is most offensive to many insects belonging to widely different families of the insect kingdom. I am strongly of opinion that a mixture of kerosene oil and cow-dung would be found a most effectual application in warding off the tsetse."[1]

Mr. Selous, the well-known African hunter and explorer,

[1] *Report on the Botanical Aspects of British Central Africa*, by Mr. Alexander White, Foreign Office, 1895, No. 373.

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states, however, that it takes several flies to kill a horse, and that of the various domestic animals, the donkey is best able to resist the fly.

"In countries where the tsetse fly is in excessive numbers the donkey, strong as he is, will not live long; but he resists the poison far better than any other domestic animal, and will pass through belts of 'fly' country without taking much harm, his constitution being so strong that he will recover from the effects of the poison, if not kept too long in the infected district; whereas an ox, or a horse, if once impregnated, will almost always pine away and die. I say almost to a certainty, because I have heard of cases of oxen and horses recovering after having been bitten, but such cases are very exceptional. The younger the animal, whether horse, ox, or donkey, the better will he resist the 'fly' poison."[1]

After a rest, I returned to Witu by the old native path, noticing the very numerous Hyphæne and fan palms, which are particularly abundant just outside the forest. About halfway between Utwani and Witu there is a swampy pool, always containing water throughout the dry weather: a solitary mango tree grows close beside it, and makes an excellent landmark. The fringe of Utwani forest which, on turning back, we skirted on our left, soon gave place to the wide open grass plain again, which the path traversed in a north-westerly direction, the soil being of the usual light friable grey loam.

On the morning of March 1, again accompanied by Mr. Bird-Thompson, I left Witu for Kipini. At first the path led over the open grass plain with numerous clumps of fan palms, and scattered Hyphæne palms, the soil being sandy grey loam, with coral outcrop. On the right there was a low-lying plain, which in the rainy season was flooded, and connected with the Witu stream; a boat could then go from the latter over the plain. Passing some small clumps of ebony trees we passed over another low-lying plain, which becomes a regular lake in the rains, and remains under water for the space of three months.

Gradually the path took a higher level, with a plain extending

[1] *Travel and Adventures in South Africa*, by F. C. Selous.

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on the right (S.S.W.), and on the left a fringe of Hyphæne palms; then skirting Ziwah (or Lake) Chakamba—said to always contain water, a pool of which I noticed on my right—we attained a higher level still above the lake or swamp. Proceeding across this higher plain, which was covered with feathery-stalked, tall grass, I saw the first mango since I started. The same characteristics continued for some time, occasional mango trees giving evidence of former cultivation. The soil, as shown by a hole on the path, was grey sandy loam, with a subsoil of yellow sandy loam, out of which clay might have been washed. Hyphæne palms in clumps and single trees were interspersed with fine mango trees and open stretches of grass, the land being an extensive flat plain; the fine and luxuriant appearance of all the mango trees testified to the depth and excellence of the soil.

After striking the direct road from Kau to Kipini, the way entered upon a low plain again, which was flooded by the Ozi river. The river was some distance away on the south-west, flowing from west to east, and fringed with mangroves. Here and there were visible open white sandy places, where the water pools had lately dried up. As we proceeded, the level varied a little, sometimes higher, then lower, but with the same general features. The tracks of hippopotami were frequent: these animals abound in the Ozi river.

Presently the path took a higher level (the low plain still continuing on the right), and crossed a plain with very short grass, and some bush. Then descending once more into the low plain, we saw right ahead a cultivated ridge with coco-nuts. Skirting a brackish pool flooded from the Ozi river, we went up the ridge, where millet and coco-nuts were cultivated in a plantation belonging to the Kipini people. We halted in this plantation, Kipini lying due south.

One of the objects of my visit to this place was to see the cotton plantation of a German gentleman, Herr Tost. It could be seen from the spot where we halted for a short rest, being situated on another low ridge beyond a valley running in a S.S.E. direction. The plain I had just crossed ended here in a fringe of scattered Hyphæne palms. Ascending the opposite ridge, after passing through native cultivation

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in the intervening valley, we found the top to be a flat table-land, with soil of a very light grey sandy loam. The house of Herr Tost was reached very soon after noon, after a journey (deducting halts) of four hours twenty minutes from Witu.

Herr Tost's house was built in a fine situation, being on the top of the ridge, at an elevation of 90 feet above sea-level. The ridge faces the sea, and slopes down in this direction to a plain about a quarter of a mile wide, covered with low bush, which continues up to Kipini and the Ozi, about two miles off. Opposite the house were the ruins of what was stated to be an old Portuguese settlement, from which an ample supply of stone was procurable; the water supply was also abundant, being obtained from wells contemporary with the old town. The ruins extended on to the cotton plantation, where more of the old wells were in process of being cleared out.

Herr Tost had now been residing at Shaka, as the place was called (its full name being Kiva N'Gwena-Wamasha Shaka), for the space of two years, after first trying land near the Tana river, which he found unsuitable for his purpose. Previously he had resided at Wange, north of Lamu, where he had planted tobacco, but his plantation was destroyed during the local troubles. Lions were reported to be numerous about here, and Herr Tost one night recently had fired at one within 30 feet of his verandah. When Kipini was built, about twenty-five years ago, it was necessary at first to furnish a guard of ten "Viroboto," or Hyderabad soldiers, for any one having occasion to go outside the town at night, so many people having been carried off by lions.

Herr Tost's cotton plantation was in a well-chosen situation, on the west and lower side of the ridge on which the house was erected. It had been opened in thick, low bush with a great deal of fan palm, and was surrounded by thick belts of Hyphæne. Herr Tost appeared to have been guided in his choice of situation and land by his German assistant, who had resided some years in the American Cotton States, and who carried out all the preliminary operations of opening, clearing, and sowing the land.

The soil was chiefly a friable rich grey loam, but interspersed

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in portions with a red ferruginous to chocolate loam; this latter being the characteristic soil on the top of the ridge near the house—a fact evidenced by the formation of the sides of several holes (6 feet deep) which had been dug for the purpose of obtaining earth for sun-dried bricks, for building Herr Tost's house. The general composition of the soil on the plantation was as follows—

| | | |
|---|---|---|
| Upper layer of friable loam | ... ... | 1 foot. |
| Subsoil: red friable loam (no clay) | ... | 15 feet. |
| Substratum: coral. | | |

N.B.—This red friable loam resembled the soil on Magarini Hill, and indicated the presence of iron.

The soil was excellent, and I was informed that sesame grown on this land realized $7\frac{1}{2}$ per gisla, as compared with $7\frac{1}{4}$ per gisla for sesame grown on other native plantations.

The first attempt was with "Uplands," or short staple cotton, and the American system of cultivation was followed, viz. raised ridges 4 feet apart, the seed being sown at close intervals of from 1 to 2 feet. The area under uplands cultivation was not more than ten acres. The cultivation of this staple had now been given up for the Sea Island variety, a commencement in this having been made in May 1892, when sixty acres were sown. The American system was discontinued, and the native method adopted—men going in front cutting a slight hole with the hoe, and women following behind, dropping seed into the holes of the respective lines, each plant being 1 foot, $1\frac{1}{2}$ feet, and 2 feet distance from the other.

While this system favours a larger number of plants to the acre, against it may be put the disadvantage of irregular lines, and the impossibility of using any agricultural implement for weeding the ground (a matter of importance on a permanent cotton plantation), so that hand weeding has to be resorted to. When the crop is only an annual one, the above system would possess the advantage of cheapness, but this is all.

The total area planted and actually under cultivation at

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the time of my visit was 140 acres, and I append a rough sketch of the estate—

| | |
|---|---|
| 60 acres<br>Sea Island cotton,<br>planted May 1892.<br>First crop, Oct. 1893. | 70 acres<br>Sea Island,<br>December and January,<br>1893.<br>October 1892. |
| 10 acres<br>Uplands short staple<br>(abandoned). | |

N.B.—No hedge separated the Uplands and Sea Island.

The first cultivation passed on leaving the house was the young cotton field planted in October 1892, on the west side of the ridge, in red to light chocolate loam. It had been planted according to native methods. The plants, though sown very late in the year, were very luxuriant, some 1 foot and even 2½ feet in height.

The sixty-acre field was also luxuriant enough, but the plants were in some cases whippy, and there were a good many vacancies. There were pods on the plants, but not so numerous as to make the promise of a 300 lbs. per acre crop an actual certainty.

In the young cotton field, planted in December and January 1893, the plants were small, but very healthy.

The sixty-acre field was sown with original American seed. In the newer and younger clearings, Herr Tost had been using his own seed, which he found to be perfectly true and good up to the second year; but after this it was not reliable.

The system of cultivation adopted was, after sowing the cotton to obtain three crops, and then—or after the seed of the second year—to cut down all the cotton, or stump it to 6 inches from the surface. For example, in sowing the cotton in April or May, it was calculated that one crop would be obtained in that year, viz. in October. In the second year two crops were expected, the first in April and the second in October. Immediately the second crop was gathered the

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cotton plants were stumped, and it was expected that the first crop yielded from the renewed shoots would be in the April of the following year. The seed was soaked previous to sowing, in a composition of goats' dung and water, cattle dung not being available. This is the American method.

Herr Tost's labour was all slave labour, which he hired in Lamu. He had previously paid 3 dollars a month, but he now paid 6 rupees per head (the fixed ratio is, 1 dollar equals 2⅛ rupees), half of this going to the owner and half to the slave, who was, besides, entitled to food allowance, one kibaba of maize or millet to each worker per day. Herr Tost calculated this cost him from 1 to 2½ rupees monthly per head, making the total cost of his labour per head (man or woman) from 8 to 8½ rupees a month—very much the same rate as on Indian plantations. All his labourers came from Lamu, and he assured me that, if necessary, he could get two hundred men from there, these rates paying the slave-owners better than cultivating for themselves, so that Herr Tost was constantly being asked if he did not want more people. Local labour was apparently very scarce, and not to be relied upon, being all required for local purposes.

As to the important question of returns, Herr Tost's experience was as follows—

Concerning the 60-acre field, the stated yield from this in October 1892, on the authority of the clerk, who planted the field and supervised the gathering, was 300 lbs. per acre. Herr Tost said he could guarantee this from his personal experience, having himself obtained 300 lbs. per acre. He estimated the second crop at the beginning of April likewise at 300 lbs. per acre, equal to a total return of 600 lbs. per acre —this estimate being based on the yield of uplands cotton, which gave 700 lbs. per acre of cleaned cotton.

The out-turn of the Sea Island, Herr Tost estimated on the basis of 300 lbs. cleaned cotton to 900 lbs. seed cotton. He had stored at this time—

60 to 75 Bales of Sea Island cotton = ... 6500 lbs.
6 to 7 ditto Uplands = ... ... ... ... 700 „

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He had not ginned any, owing to the great expense of cleaning the cotton by manual labour. He possessed one ginning machine, worked with bullock-gear, but the large driving-wheel required had not arrived at the time of my visit.

These expected returns would have been most encouraging, had they been based on the *actual yield* of the whole estate, and not from the out-turn of special fields alone.

As to the expected yield of 300 lbs. more in April, this might or might not occur, and was still only a possibility, the season having been an unusually dry one, and detrimental to all cultivation. However, the cotton was good, and I had no doubt that, with care, excellent paying results would be obtained. A sample of Sea Island cotton grown at Kipini and sent first to Germany and then to Manchester and Liverpool, was reported upon as "fine cotton from new land, but too fine."

Concerning expenditure, Herr Tost estimated it roughly at twenty rupees an acre—plus, of course, cleaning and ginning, baling, transport, and shipping charges.

For *returns* he estimated one crop of cotton the first year at 300 lbs. cleaned cotton in October. The second year two crops of 300 lbs. each per acre = 600 lbs. cleaned cotton per acre.

I now give the experience of Herr Tiede, a German gentleman residing in Lamu, and at one time British Consular Agent there, who having opened some plantations on the mainland, is qualified to speak with practical knowledge of the subject. Herr Tiede did not expect the yield of Sea Island cotton to exceed 400 lbs. of cleaned cotton per acre. His own experience of its out-turn was that 12 lbs. of Sea Island cotton yielded—

| | | |
|---|---|---|
| Lint | ... ... | 4 lbs. |
| Seed | ... ... | 7 lbs. |
| Refuse | ... | 1 lb. |

Before leaving the subject, I wish to call special attention to the very encouraging Broker's Report on a sample of Herr Tost's Sea Island cotton which I picked out at random, and

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brought home with me. The sample was pronounced "a decided success, very fine staple, a good length and strength; value, one shilling per lb."

I spent a pleasant day on the plantation, and Herr Tost was a most courteous host.

Big game appears to be abundant about here. Lions and leopards are very numerous; the latter are very fierce and dangerous when attacked, they are also very destructive to poultry. Omari Madi, of Witu, told me that sixty of his hens had been carried off by leopards.

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## CHAPTER XX

### KIPINI TO LAMU—PATTA ISLAND

Kipini—The Ozi River—Camp at U'Kanga—Makombagni—Lake M'Pekatoni—Hindi—Bomani—A Flat Country—Fungu Zombo—Sivatoni—Arura—Wild Cotton—M'Kumbi—Return to the Coast—M'Kanumbi—March to Makowé—Lamu Island—Arrive at Patta Island—The Bajoni—Coir Fibre—The Wa-Siyu Patta—Difficulty in getting away—Grasping Natives.

THE next morning (March 2), Mr. Bird-Thompson accompanied me on a visit to Kipini.

Kipini is still a fairly large town with a custom-house, situated on the north bank of the river Ozi at its junction with the sea, and about forty minutes' distance from Herr Tost's plantation along the sea-shore, which has a good open white sandy beach.

The town stands on a promontory with low white sand-hills rising about 50 to 60 feet above the shallow flat sea-shore, the chief characteristics of which are a white sandy soil with low bush, scattered lanky Hyphæne palms, and a thick growth of mangroves on both sides of the Ozi river. The only exports from Kipini are millet and sim-sim, the trade of the Tana being diverted to Kau through the Belesoni canal. The population is about 800. The few coco-nut clumps in the town were all fine trees, and their appearance should encourage extended cultivation of other trees. I noticed one or two date palms and some silk-cotton trees, and rice growing along the banks of the river.

Kipini, as I have said, stands on the banks of the river Ozi, and the following sketch-map will assist the reader to take in the description of the surrounding country as seen from the



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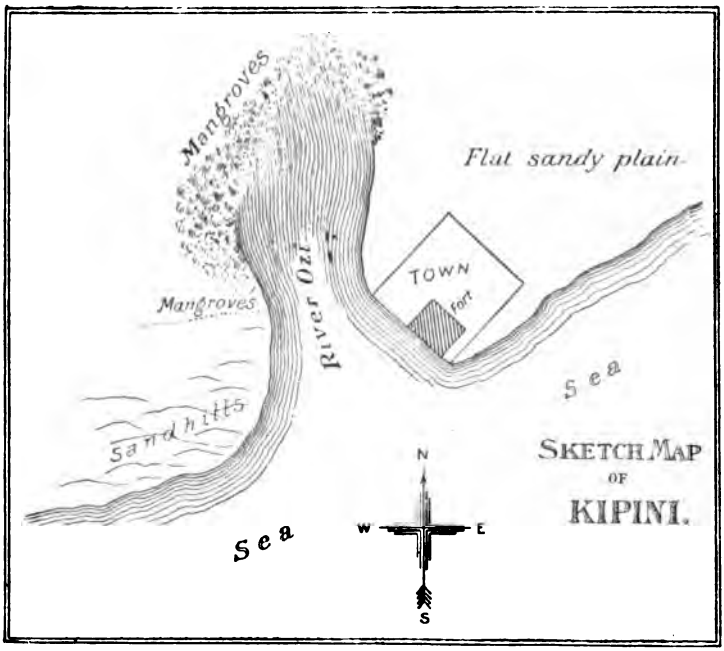
top of the old fort commanding the entrance to the river. The banks of the Ozi are thickly fringed with mangroves, in some places to a width of 300 yards.

Beyond the further bank of the Ozi, to the south-west, the country consists of a low swampy grass plain (black soil) extending to the Tana river. To the westward, low sand-hills fringe the coast-line, and beyond these are thick Hyphæne palm woods with undergrowth of scrub stretching inland for




a distance of about two miles. There is a slight rise from beyond the swampy plain towards the Hyphæne palm woods, and on this higher land are situated some coco-nut shambas belonging to Kau cultivators.

The mouth of the Ozi is wide and sandy: there is a bar which can only be crossed at high tide, but once this is passed dhows can go up to Kau at any time, the channel of the river being very deep. The shore on the northern side consists of a white sandy "dune" covered with low thick scrub, and to

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the north-west, looking beyond the curve described by the river before reaching the town, are thick mangrove swamps.

I walked through the town, which is very straggling, and observed numerous clumps of castor-oil plants growing wild both round the old fort and outside the town. Numerous flocks of goats were grazing all about.

I returned to Herr Tost's for breakfast, and in the afternoon, after bidding a cordial good-bye to Bird-Thompson, who had so kindly accompanied me thus far, and whom I never saw again, I started once more alone for U'Kanga, lying about one and a half hours' march away in a north-east direction, over a flat open plain. The country I passed through was chiefly thick low bush alternating with open patches, dotted over with Hyphæne and dwarf palms, baobabs, guinea-grass, and in one place there was a clearing with some fine stooks of harvested sim-sim, fully 5 feet high. The soil on the whole was an excellent grey loam passing into chocolate, with here and there some coral outcrop. Finally, after crossing some open country evidently once cultivated, I arrived at U'Kanga. This was a small village enclosed by some fine timber trees and scattered mangoes situated on the edge of a hollow from which the water supply is derived. The village is surrounded by a large open plain covered with grass and clumps of dwarf palm, and the area in the immediate vicinity had evidently at one time been much more cultivated. The plain is bounded on the south-east by a low ridge of rounded hillocks. I camped under a large tree with wide-spreading branches much resembling a jack tree, having a very similar bright green leaf with very long stalk. Some wild castor-oil shrubs and arrow-root (*Tacca pinnatifida*) were growing round about.

Next day I proceeded onwards to M'Pekatoni, the thermometer readings during the day (at 6 and 11 a.m. and at 2 and 6 p.m.) being 78°, 86°, 86°, and 80° respectively. I noticed on the north-east side of U'Kanga another small shallow swamp or pond, with mango trees round it.

The country was as a whole very flat, mostly covered with the usual vegetation, while in the more open part a good deal of wild arrowroot was growing in thick clumps. In places

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the aspect was park-like, interspersed with swamps and high feathery grass. Everywhere the soil was of an excellent grey loam. The path now led due north, and little more than half-way, at a place called Makombagni, cultivation began again to appear; we passed through a plantain shamba, luxuriant mango trees and maize-fields, and by a coco-nut clump of about 200 trees. Wild arrow-root was growing in abundance, and, I was told, forms an article of export to Lamu. In a short time I again came on shambas situated in a low plain: they consisted of coco-nuts, bananas, mangoes, maize, and sweet potato beds. Passing these, I crossed an open plain with an extensive swamp in the centre called Ziwah la Ramu, beyond which there was little variety until I reached M'Pekatoni after three hours' marching. The village is situated on the western shore of M'Pekatoni lake, whence it takes its name. The lake lies in a north-east direction, the eastern portion being at this time dried up, but when full it is said to be fully three miles long by half-a-mile broad. I camped under a grove of mangoes on the western shore, near the village. Rice was growing on the dry margin of the lake; the hippos did much damage to the crops, and the people had dressed up "scarecrows" and placed them on raised platforms to frighten them away at night. To the east and south-east the country is flat and low, and covered with Hyphæne palms, baobabs, and near the village with mangoes and a few clumps of silk-cotton trees.

In the afternoon I went right round the lake; the water—probably supplied by springs—is fresh and good, and lies in a natural basin, the ground sloping down to it on all sides. It narrows considerably to the north-east, where there is a canoe ferry. The banks are fringed with reeds and aquatic grasses, and the soil is a grey sandy loam. On the south-east side the outcrop of coral is frequent; the sea is said to be about six miles off in a straight line.

I saw one or two hippo heads above water a little way out, so I crouched down in the high grass, hoping they would come near enough for me to get a shot at them; after waiting a long time, I tried crawling through the grass to get nearer to them, but they were too wide-awake, and disappeared under



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water. Returning to the camp, I waited until dusk, and then went first down to the rice-fields without success; then to the water's edge, where I got a fair front shot at one. He went under at once, turning a complete somersault. The villagers were highly delighted at their enemies being reduced by one. Early next morning, hearing that there were two canoes available, I procured one and punted out into the lake to try for another hippo. One was watching me about 40 yards away; I fired and hit him, and he disappeared with a big splash, but as the top of his head only showed above water, I doubt if I more than wounded him. Then after firing a couple of long shots at another, which I clean missed, I had to land, as time was getting on, and M'Kumbi, my next halting-place, was a good sixteen miles away.

We got under way at 9 a.m., skirting the lake and wading through the ford, which was about knee-deep. After crossing a portion of the dry bed of the lake the path took a north-west by west direction through thick thorny scrub, interspersed with baobabs, etc. Further on the country became more open, with swamps here and there, and very thick and numerous clumps of dwarf and scattered Hyphæne palms, with an occasional mango tree, the only survival of a former cultivation. The path next descended into a cultivated valley where scattered mangoes, cashew-nut trees, papaw, and small fields of sim-sim, beans, and cassava surrounded the small village of Hindi, which I reached at 10.30 a.m. The general character of the country and vegetation was most luxuriant, and the houses of the village were large and presented quite a comfortable appearance.

Beyond Hindi the country retained much the same characteristics, a too minute description of which would only weary the reader. A large field of sim-sim 3½ to 4 feet high bore witness to the fertility of the soil, whilst the numerous mango trees testified to the large area that must have been under cultivation in former times.

At 11.20 a.m. I reached the small village of Bomani, surrounded by the usual native cultivation, and some fine timber trees called "mtaa." The village was situated in the middle of an open and extensive grass plain, the soil of which

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was a grey loam of some depth. The people obtained their water supply from a swamp close to the village.

At 11.50 a.m., after crossing the telegraph-line running from Witu to Lamu, I reached Fungo Zombo, and halted till 3 p.m. The heat being very great made marching in the middle of the day very trying. Since leaving Hindi I had been crossing an extensive grass plain, clearly at one time under cultivation; the Hyphæne palms had now almost entirely disappeared. Fungo Zombo, similar in appearance to the two villages just passed, was especially remarkable for the number and size of the fine mango trees. Here also the water supply was obtained from a swamp outside the village.

Between Fungo Zombo and M'Kumbi I passed two more villages, called Sivatoni and Arura, the path continuing over the same large open plain, with many mango trees, some baobabs, and once again thick clumps of Hyphæne palms on both sides of the way, the grass thick and rich and sometimes with long feathery stalks. The village of Sivatoni, enclosed in a "limbo limbo" fence, possessed two large goat-houses. The water supply was from wells 6 feet deep, and about five minutes' walk away. The soil was grey loam; and there were some fine silk-cotton trees growing in the village.

Arura, which I reached at 4.15 p.m., was another small village of cultivators, where I noticed some fine wild cotton plants growing, having a reddish or purple flower and thick stem; and also some luxuriant castor-oil, a clump of this being fully from 10 to 12 feet high. Hence the country continued open as before, with generally speaking the same characteristics of palm, mango, and baobab, and a similar soil. Glad was I when, at five o'clock, I sighted M'Kumbi from the top of a low ridge, lying a short distance ahead. This was a fortified post established by the Company to watch Jongeni, three hours' march distant to the north-west, and the head-quarters of Fumo Omari, the rebel Sultan of Witu.

M'Kumbi consisted of a few houses inhabited by the native garrison, with a very comfortable house for the accommodation of the European officer in charge, Mr. Bird-Thompson (then in Witu), the whole surrounded with a very thick thorn

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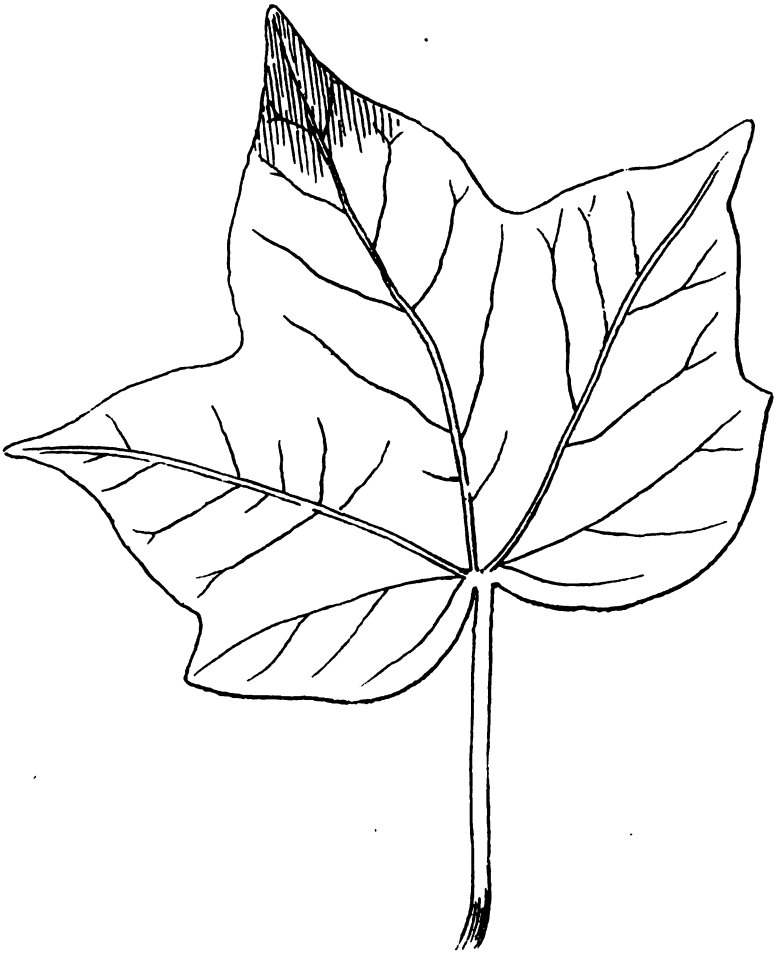
fence. It was a real pleasure to be in a house once more, though what with the numerous fleas which disputed the possession of the house with me, and the singing of the



LEAF OF WILD COTTON PLANT GROWING IN THE VILLAGE OF ARURA.

soldiers outside, my night was rather disturbed, and sleeping in a house was not, I found, the unalloyed luxury I had expected it to be.

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Next morning was given up to an examination of the surrounding country. The temperature on March 4 and 5 was as follows—

*In the Shade.*

| March 4. | March 5. | |
|---|---|---|
| 6 a.m. (M'Pekatoni), 76° | 6 a.m. (M'Kumbi), | 71° |
| | 10 a.m. | 81° |
| | 1 p.m. | 91° |
| 6 p.m. (M'Kumbi), 80° | 3 p.m. | 80° |

A shallow river flows round the back of the stockade, and from it a supply of excellent water is obtained. It was then very low, with pools here and there only, but it never dried up entirely.

Following the river, which flows through an undulating plain, I found that it gradually grew wider and shallower, until it was lost in a long swamp extending to the north and north-west, which it evidently drains. Looking away to the west and south-west one gazed on the open grassy plain, with its scattered mango trees, Hyphæne and fan palm clumps; to the north-west and north-east on thick Hyphæne palm woods; to the eastward on a grass plain. A small arm of the swamp ran out to the south-west, ending in a shallow basin, which gradually merged into the surrounding plain.

Continuing onwards for some time longer over a low flat country, evidently flooded in the wet season, and passing occasional clumps of Borassus palm, I came upon a large dry swamp extending from the south-west to north to north-east. Here I turned back, the small escort I had taken with me being insufficient if we came upon some of the rebel forces of Fumo Omari.

In retracing my steps I followed a south-east direction through a fine rich country, with greener grass and much thicker undergrowth, the soil being a good light grey loam; the same characteristics of country appeared to extend to the north-east and east. Game was reported to be very plentiful about here in the wet season. I now came upon a thick palm wood extending up to the M'Kumbi river, from which I emerged close to the stockade. The river here is from 90 to

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100 feet wide, and its banks are from 3 to 4 feet high. The grass had been burnt and new shoots were springing up vigorously, promising good pasturage for cattle. Close by I came upon the bed of another small stream connected with the larger one.

When back in the stockade I had an interesting conversation with the Akida or native officer in command of the askaris. It appeared that he had been up to Jongeni, and

BORASSUS PALMS.

on my asking him for a description of the country round there, this is what he told me—

Grass land with mimosa and Hyphæne palms—much the same sort of country, in fact, that I saw to the north of the stockade—extends right up to Jongeni, where thick forest begins. There are no swamps, but only occasional hollows where rain-water lies. Jongeni appears to be the general name for numerous stockaded villages scattered about the forest. The soil is dark grey.

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It was a matter of deep regret to me that the disturbed state of the country prevented me from carrying out my intention of exploring the forest round Jongeni and the whole country lying north of Witu. However, it could not be done. Mr. Rogers, the Company's officer at Lamu, who was in command of the (Indian) police force, declared he could not be responsible for my safety, and with my small number of porters it was useless to attempt it, with the almost certain prospect of falling into Fumo Omari's hands, so I had reluctantly to give up the idea and turn my face southwards.

I started for M'Kanumbi, about six miles distant, the same afternoon at 3.30 p.m., marching the greater part of the way over a flat grass plain; with the same traces of former cultivation, and the usual growth of Hyphæne palms (many of these lanky from over-tapping for toddy). They became fewer as I proceeded, and were varied by borassus and fan palms, bush, etc., the soil the same light sandy grey loam. About half-way I passed a clump of about fifty mango trees growing close by an apparently deserted village. Beyond, they became more frequent, some by their fine appearance giving evidence of the richness of the soil.

At 5.15 p.m. I came upon the salt-water creek running up from M'Kanumbi, here about 10 feet wide and fringed with mangroves, but opening out more widely further down. It extends north-east and east, with one bay to the southward. The soil was deep white sand.

I reached M'Kanumbi at 5.30 p.m. This is but a mere cluster of huts on the grass plain close to the creek, but is of importance, from the fact that it is the outlet of nearly all the produce of the Witu district, and most of the indiarubber coming from Jongeni is shipped here for Lamu.

Observing a fringe of coco-nuts and mangoes on the southern or furthest side the creek, I decided to cross over, for not only was there no cultivation round the village, but no water either, it had to be brought over from the other side. Crossing the creek just as the tide was running up I came upon the village of Kilimani, surrounded by the coco-nuts and mango trees which I had noticed all the way from M'Kanumbi. I camped below some small mango trees on the

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edge of a large shallow pool where the M'Kanumbi people obtain their water supply. This they carry across at low tide on donkeys' backs in empty kerosene oil tins, which are as much prized by them as valuable bits of old china are by us.

It being nearly dark when I arrived, I was not able to notice my surroundings till the following day (March 6), when I found that I was camped in a large open plain surrounded by mango and coco-nut trees, the pool being nearly in the centre. In the wet season this is drained by a small stream. I spent the day examining the neighbouring country, which I found to be flat and fairly well cultivated, although there was a good deal of land abandoned or allowed to lie fallow. Apart from the ordinary ground cultivation I noted many scattered coco-nuts, but there was one luxuriant plantation—the first I had seen since leaving Kipini; soil fertile, friable grey loam. Several small villages, Moinkanda, Milimani, Makomani, Kavo Kavo, all fairly close together, are scattered around. Cultivation is said to cease at Mapeya, a village lying about six miles to the S.W. From a place called Kitugani on the M'Kanumbi creek, the sand-hills of Lamu can be seen quite distinctly.

Next morning at 6 a.m. I started on my long march towards Lamu, again crossing M'Kanumbi creek, the path beyond winding about to all the points of the compass, but at last going steadily in a N.N.E. direction.

I reached the small village of Wandamunio at 7.50 a.m., having waded across three salt-water creeks on the way; the intervening plains were of a sandy nature.

Wandamunio has but little cultivation surrounding it. There are some bananas, etc., and it boasts of a single coco-nut tree. It is situated on the edge of another creek fringed with thick mangroves, which runs from east to west, and has to be crossed by a very slippery native bridge, as the water is deep, and there is plenty of thick grey mud. It took us over half-an-hour to cross this creek and a mangrove swamp beyond, for the bridge was completely under the water, which reached over one's knees, and several of my porters fell headlong into the creek and had to be fished out with their loads; luckily my bedding and clothes escaped!

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At 8.45 a.m. I passed Idio, a small village bearing S.E. on my right hand, and situated lower down on the creek that I had just crossed. A little south of Idio lies the village of Muicarabu, where formerly they used to make salt.

After leaving Idio I came upon the telegraph-line, which I followed in a N.E. by E. direction over a flat sandy plain, crossing occasional back-waters—the whole country very flat and low. I passed numerous swamps now dry, which doubtless flood a great portion of the country in the rains. There were a few scattered mango and baobab trees, and the soil was very sandy. Shortly before reaching Unga, a large and prosperous-looking village (one hour and twenty-five minutes' march from Idio), the country improved in appearance, the land becoming higher with thicker vegetation.

I reached Unga at 10.10 a.m., and waited till 10.30 to allow the stragglers to come up. Unga is well situated on a creek opposite Lamu Island, and is surrounded by luxuriant mango trees, amongst which I was pleased to notice numerous cocoanuts. The cultivated area was here much larger, and I was particularly struck with the fact that there does not appear to be any break in the cultivation between the N.E. and S.W. monsoon rains, as in the Melindi districts. In many fields which I passed, the sim-sim, beans, etc., planted in the N.E. rains, were only now being harvested, and yet other lands were hoed and some actually sown. Does not this point to a heavier rain-fall, or at least a much earlier one than in the country further to the south?

Beyond this the path skirted the sea-shore, with its shallow sandy back-waters and thick mangroves; on my left the open grass plain continued with here and there patches of cultivation and scattered mango trees. Kilimani, a mere cluster of ten or twelve houses amongst mango trees, and situated on another creek, was reached at 11 a.m., and here I halted till 2.20 p.m. The water supply was good, both from a well and from a swamp to the north of the village.

As will be seen from the following diagram, Kilimani lies on the inner edge of a large shallow back-water running up from the southward, as the creeks generally do on this coast. On the same side, and about a mile lower down, is Makowe, to

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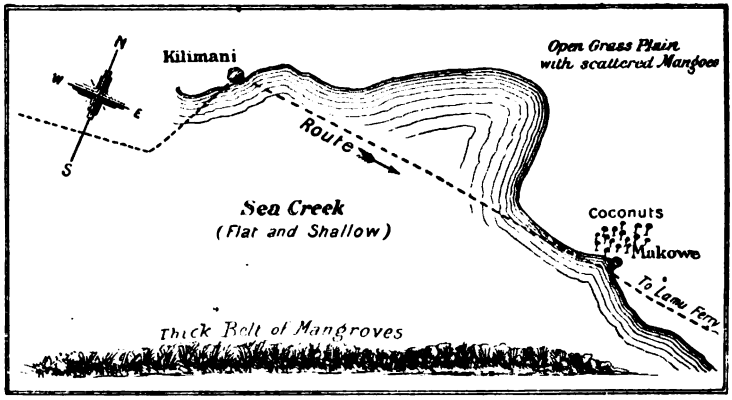
which I shall presently refer ; a deep thick belt of mangroves fringing the creek to the S. and S.E. towards the sea, on which side the Lamu sand-hills are visible to the S.S.E. On the landward side, to the W.N.W. and N.E., stretches a flat open country, which is very sparsely cultivated.

At 2.20 p.m. I resumed my march over the back-water, shortly afterwards passing through Makowé, with its few coco-nut and mango trees, then over a small sandy plain overgrown with scrub, and dotted over with numerous clumps of fan palms Beyond this the path once more led across the sea-creek, over which, and through thick mangroves, I continued until 3.15 p.m., when, to my delight, I reached




the sea-shore, which was low, flat, and sandy. Lamu Island lay opposite, with only a narrow estuary called M'Lango Kipungani between. The telegraph-line from Witu and Mombasa, which I had so frequently passed, is here connected by cable with Lamu, the junction being in two wooden-roofed huts raised above the highest tide level.

The ferry is also here, and it took me nearly an hour, the ferry-boat being but small, to get all my porters and loads across. We then resumed our march to Lamu town, about an hour's distance from the ferry, passing first through shallow mangrove swamps, and then over several of the low sand-hills I had noticed from the mainland.

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The soil was everywhere deep white sand, which seems the characteristic of Lamu Island. The path led through thick groves of coco-nuts extending up to the town, where I arrived at 5.30 p.m. I took up my quarters just outside the town, where the Liwali of Lamu courteously placed a comfortable house with a fine roomy verandah at my disposal. Lamu is, after Mombasa, the chief port on the coast, and is connected with Europe and India as well as Zanzibar by regular lines of steamships. The town is one of the oldest on the coast, and contains 5000 inhabitants; it is a mass of crowded houses. The island is seven miles long, rising from

LAMU FORT.

the shore into sand-hills from 30 to 250 feet high, and covered with scrub. At the eastern end of the island lies the village of Shella, the site of a former Portuguese settlement. As will be seen on the map, Manda Island lies to the N.E. of Lamu, from which only a narrow sea channel divides it. With the exception of a few fishing villages on the coast, it is uninhabited, and is chiefly covered with low trees, thick bush, and grassy plains.

I remained three days in Lamu, starting again on March 11 for Patta Island, situated to the east of Manda Bay.

I believe I was the first European in modern times to land

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on this island, to which I proceeded direct from Lamu by dhow, my first destination being the town of Paza or Faza. The journey lasted from 7 a.m. to 6.30 p.m. My arrival was so strange an event that the whole town turned out to witness it. Mze Saif, the chief of the place, to whom I brought letters, was, I found, absent on the mainland, but his sons welcomed me, and offered me a house; however, I preferred my tent, and they escorted me to a coco-nut shamba outside the town where a large, curious crowd surrounded me, and remained, watching my every movement till quite late in the evening.

Patta Island is fifteen miles long by about five miles wide and surrounded by mangroves. It is very flat, the land never rising more than 50 feet above sea-level. The island is of coral formation, and the soil, so far as I observed it, consisted of a white to grey clayey loam as subsoil, with an upper stratum of grey loam. The walls of the houses of Faza were of the same grey colour. In the coco-nut shamba where I was camped the upper loam was sandy and the outcrop of coral frequent.

Faza is situated on a tidal creek, navigable for dhows, and thickly fringed with mangroves. The town is so girdled by mangrove swamps as to be practically an island when the tide is high. There are several good coral-stone houses in Faza, which is a fairly large place, but the majority of the houses are built of wattle and mud, with "makouti" (coco-nut thatch) roofs.

To the westward the town is fringed by mangroves (growing in the sea-creek), and beyond this by thick coco-nuts intermingled with Hyphæne palms. The coco-nuts were thickly planted, and extended southward of the town.

To the north-west the land was low, with numerous mangroves on the seaward side, and on the land side covered with low bush, baobabs, clumps of Hyphæne palms and scattered coco-nuts. Dwarf or fan palms were reported to be very numerous on the island, and I understood that mat-bags were largely made, and that a great export trade of these existed with Lamu and Zanzibar. Rope is also made from the fan-palm fibre—perhaps fastenings would be the better word—they are used for tying rafters together, etc. In fact all rope for fastenings is made from this fibre, which is plaited.

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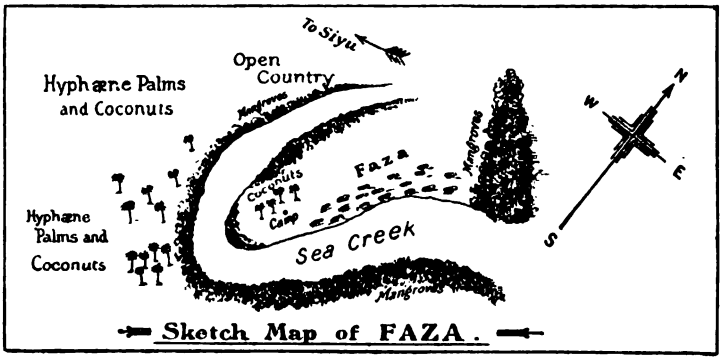
The chief industry of the place appeared, however, to be the manufacture of *coir* rope. The mode of preparing it consists in soaking the husks in sea-water for three to five months, after which they are beaten out and washed. An ordinary heavy stick is used for beating out the fibre, and this appeared to be the chief occupation of the people here—tapping being heard from almost every house. The cleaning of the fibre is done chiefly by the women, the men making the rope and the fan-palm mat-bags. Clean fibre sold at one dollar a frasila. Only rope [1] is exported, and no coir fibre or copra. The sole use of the nuts commercially is for their husk, the kernels and milk being used for cooking and drinking. On my return to



Sketch Map of FAZA.

England I brought a few native samples with me. The broker's report upon them was as follows—

"*Coir fibre*, poor, dirty, dull—sound value per ton, £4. *Coir yarn*, poor, dark colour generally, fair make, but somewhat irregular. Sound value per ton, £13 to £14.—November 9, 1893."

Cattle on the island are scarce and dear, prices ranging from $30 to $40, but sheep and goats, especially the latter, were fairly numerous.

The inhabitants of Faza and of the north of the island generally are all Bajoni—identical with the Guniahs so often

[1] Coir rope is only made into thin strands in Faza, being twisted into thicker ropes at Lamu.

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referred to; they are also called Watiku, and claim to have originally come from Arabia, and to have colonized all the coast-land extending from Lamu to Port Durnford, and to be descendants of the original builders of the ruined towns scattered along that coast. After the destruction of these, following the Galla invasion, they fled to Patta Island.

The Bajoni, who are lighter-complexioned than the Swahilis, do not carry swords like the Arabs and Swahilis, but a sharp dagger-like knife with the point fashioned in a peculiar way as if it had been broken off. They are also fond of chewing coffee-beans, but do not drink the infusion.

My first day on Patta Island was a busy one, what with walks through the town and neighbourhood and receiving the visits of Mze Saif's sons and the elders of the place.

Doctoring was apparently considered by the Bajoni as pre-eminently the art of a European, and I had a considerable and unexpected practice thrust upon me during the day. I had to visit a sick man and then a sick woman, proceeding to their house in regular state, escorted by the sons of Mze Saif and all the elders of the town. After this I went to the *baraza*, or place of assembly, where I explained the objects of my mission to the chief residents of the town, afterwards holding a *levée* of apparently all the sick people in Faza—the maladies being chiefly lung and bowel complaints. I should say, judging from the number of ailing people that I saw, that the town is not healthy—the cause being the brackish water and the mangrove swamps surrounding it. The Bajoni are great toddy-drinkers, and I noticed all the Hyphæne palms are regularly tapped for the purpose of obtaining the sap.

On the same afternoon I left for Kisingitini, a village lying to the north-east of Faza, starting at 4.20 p.m., attended by the Kisingitini head-man, who had been specially sent for, and two Bajoni askaris, Mze Saif's youngest son escorting me part of the way. We first crossed on foot the channel by which I had come up in the dhow the day before, the tide now being out. Beyond this the path skirted the sea-shore (white sand with a clayey subsoil and thick mangroves). On the landward side there were numerous coco-nuts, thickly planted and intermingled with Hyphæne palms, many of the latter

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being dead—killed most probably by excessive tapping for toddy. Half-an-hour from Faza I passed the small village of Mabogi in the midst of open flat country covered with low scrub and scattered thick clumps of Hyphæne palms, and coming a short distance further on to the somewhat larger village of Bajimali, situated on a low mangrove creek and surrounded by a thick fringe of coco-nut and Hyphæne palms. As we drew near Kisingitini the head-man said he must be allowed to go on ahead, for the people would be frightened at the sight of a white man and would run away! So I stopped to allow him time to prepare the public mind for my arrival.

I arrived at Kisingitini at 5.15 p.m. It is situated on a small open sandy bay to the eastward of the small island of Sidembe. It is fairly large, with some good houses, the mosque being specially noticeable. To the southward the village is surrounded by low thorny scrub and the usual palms, and just outside the village are some coco-nuts, with a few papaw trees and castor-oil plants. The occupation of the people is divided between fishing (fish are said to be plentiful), cutting mangrove *borities* for export to Lamu and Mombasa, and cultivation.

All the people turned out to look at me, and I was followed by a crowd in my walk through the village. The Bajoni did not improve on acquaintance; they seemed very grasping, the head-man particularly so. He pointed out a place for my camp, and distinguished himself by asking for everything he saw!

The water from the village well was very brackish—in fact, so detestable that it made me quite ill, and I did not thoroughly recover till I got back to Faza, where I confined myself entirely to the water of green coco-nuts. Midges from the neighbouring mangroves were very troublesome, and made writing quite impossible—being worse in the early morning before the sun got strong.

I left for Siyu on Sunday morning, March 12, starting at 6.20 a.m. in a S.W. by W. direction, crossing again on foot the flat shallow sea-creek, which divides the village of Bajimali from Kisingitini, the point of land to the N.W. being all thick mangroves. At Bajimali I noticed several heaps of

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coral-stone lime, evidently an article of export, together with piles of fresh-cut mangrove *borities*.

At 6.40 a.m. I reached Yabogi, another small village, situated on rising ground on the western end of Bajimali sea-creek, and fringed on the S.E. and south side by mangroves, the plain beyond being covered with low prickly bush, scattered Hyphæne, and thick clumps of fan palms. The Hyphænes were all tapped. Soil yellow and sandy.

At 7 a.m. I reached Tundwa, a large and prosperous-looking village, with numerous good houses built of coral-stone, and surrounded by fenced-in gardens. Coral-stone was abundant, and I passed many heaps of freshly-burnt coral-lime. The water supply was good, and appeared abundant. It took me ten minutes to walk through the village, around which luxuriant groves of coco-nuts were growing in a white to yellow sandy soil.

From Tundwa onwards, excepting one or two mangrove swamps on my left, cultivation continued steadily, the lay of the country being very flat; coco-nuts were very numerous, and as a rule very thickly planted, often lanky and tapering; the undergrowth is apparently only cut down periodically, and this, with excessive tapping for toddy, would doubtless account for their unhealthy appearance; the Hyphæne palms appeared almost as numerous as the coco-nuts. On the uncultivated portions the ground was covered with thick fan-palm clumps, low mimosas and thorny scrub—the soil everywhere being very sandy, in colour white to grey and latterly yellow. Mango trees with an occasional tamarind were also frequent, and I was particularly struck, not only with the number, but the extraordinarily large size of the cashew-nut trees (*Anacardium occidentale*), the finest I had ever seen; many of them were as large and luxuriant as mangoes.

In a coco-nut shamba that I passed I noticed that young plants had been planted to fill up gaps amongst the older trees, which were nearly all lanky and some dying. It is a question whether the death of these trees has been caused by neglect or by excessive tapping for toddy. All the fields were then being cleared in readiness for sowing.

At 9 a.m. I halted to allow one of my Bajoni askaris to go

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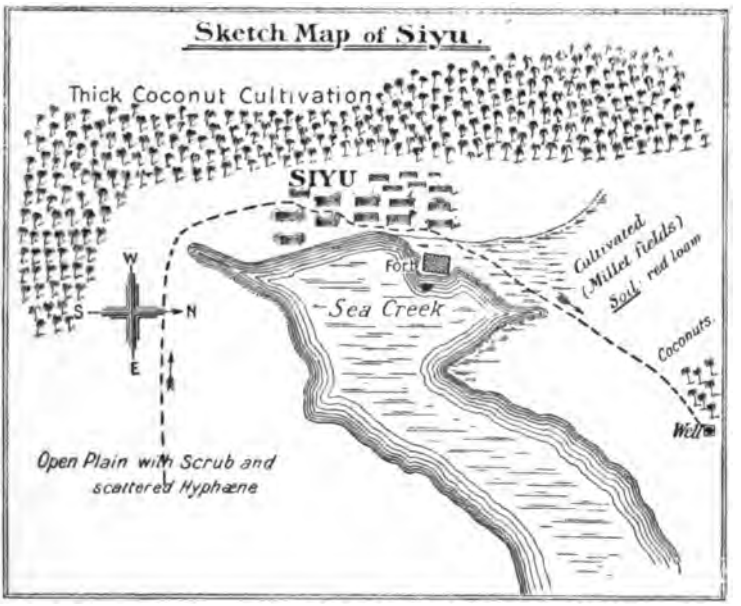
on ahead to deliver the letters I was bringing to the Wa-Siyu head-men, and to advise them of my coming. Siyu being now visible in the distance, with a thick fringe of coco-nut trees behind it, I halted under a borassus palm, and whilst resting, several women passed me carrying cut strips of fan-palm leaves, tied into bundles, for making mats and rope.

After ten minutes' halt I started again for Siyu, which I reached at 9.25 a.m., it having taken me exactly two and a half hours—deducting thirty-five minutes for various halts—




to reach the town. Guided by the head-man's messenger, I marched towards a coco-nut plantation outside the town, to reach which I had to cross the sea-creek on which the town is situated. Reaching the shamba I camped under some fine shady mango trees, close to an old stone well, said to have been dug or sunk by the Portuguese.

The above sketch will assist the reader to follow my description of the town, the dotted line showing my route.

Siyu, certainly the largest town on Patta Island, is situated



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at the end of a narrow sea-creek, the approach to the town being defended by an old stone fort. Koyo, half-an-hour's distance to the west, is the harbour for large dhows, and it is only in the wet season and at high tides that boats and small dhows can come up to the town. This has a considerable population, and I was much struck by its appearance and the size of some of its coral-built houses.

Siyu is the principal town of the Wa-Siyu, who claim to be of Persian descent, and who also inhabit the mainland opposite Patta Island. They are quite distinct from the Bajoni. This portion of the island is specially noticeable for the large area under coco-nut cultivation, the plantations extending for some considerable distance beyond the town. The extreme lankiness of many of the trees was most probably due to the excessive tappings, for Siyu toddy is quite noted, and is largely exported. The townspeople do not export copra, nor do they use the nuts for any but cooking purposes.

By this time the head-men of Siyu had arrived to see me, headed by Omari bin Issa; they were very anxious for me to stay in the town, but I still felt too seedy from drinking the bad water at Kisingitini to see many people that day, and hearing that Patta was not very far away, I resolved to go there at once, promising to stop again at Siyu on my way back. I had a short conversation with the head-men about coco-nut cultivation and export, and pointed out to them the commercial value of the nut, and the profits to be derived by exporting copra and coir fibre. The head-men listened attentively to my remarks, which they promised to consider, and on resuming my journey they escorted me part of the way.

I started for Patta at 3 p.m. in a westerly direction; the path skirted the creek, and was fringed with thickly-planted coco-nuts on both sides. After about two miles I passed the site of an old battle-field called Sikoko wache Amadi, after a Siyu chief who was killed here, and where the Wa-Patta and Wa-Siyu had fought. The creek now opened out widely; it had a sandy flat bottom, with many low mangroves growing in it, the fringe of coco-nuts still continuing on both sides.

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At 4.20 p.m. the path turned off from the creek across a grassy plain with scattered mimosa bush. To the south, as far as I could see, the whole country was covered with a thick mangrove growth. At 4.40 signs of cultivation began once more to appear, and I passed the shambas of Tiramkoni and Kitoka. Formerly the Patta or Pate people had large coco-nut plantations, but these had long since been destroyed in the war times, and now only a few fields of millet are to be seen scattered here and there. At 4.55 I crossed a low ridge with a large coral out-crop, and here obtained a view of Bori, lying about two miles to the north, thickly surrounded with mangroves. Bori is a small harbour belonging to the Pate people. Beyond this ridge the soil improved greatly—a reddish sandy loam with thick mimosa scrub and fan-palm clumps, whilst on a low hill to the left called M'Lango la Siyu, to commemorate a defeat of the Siyu people, stood the old walls and ruined gateway surrounding the once strongly-fortified capital of the Wa-Patta, which I reached at 5.30 p.m.

Patta is situated on the banks of a creek running from east to west, and within sight of the sea, and now contains only about 300 people. The soil of the plain surrounding it is a light grey to sandy loam, much intermixed with coral; goats and sheep are numerous. It was once a large and flourishing town with as many coco-nuts as Siyu, but misfortunes of war have caused its present decay, and the large population that once existed here is either dead or dispersed amongst a few villages in the Witu district near Lake M'Pekatoni. The war arose out of questions of sovereignty claimed by the Sultan of Zanzibar over the Patta people, who were eventually defeated. They then fled to the mainland of Witu, asserting their independence there. The nearly deserted town presents a most melancholy appearance; the old stone walls, still in a wonderful state of preservation, bear witness to the former strength of the place, but the Sultan's palace and houses are complete ruins, with old cannon still lying about here and there. The town was originally enclosed within a square, the walls having towers at the four corners.

I visited the descendant of the once powerful Patta Sultan, by name Amadi bin Sultan Fuma Bakari Nabatian, who

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afterwards returned my visit, and brought me a goat—all he had to offer—a gift which I returned with interest.

The next morning, March 13, I went round the town with Amadi bin Sultan, and remarked that the Patta people cultivate tobacco in a small way: there were a few fields of it growing. The plant has small leaves and pink blossom. Heaps of coral-lime were placed here and there ready for export to Zanzibar. I observed that the creek runs up beyond the town in a south-west by west direction.

Returning to Siyu the same day, travelling by the way I had come, I put up this time at the very comfortable house of Omari bin Issa, who gave me a most sumptuous repast. I renewed my conversation with him and several of the elders on the subject of coco-nut, copra, and other matters, and hope that my words have borne good fruit, for there can be no doubt that a large export trade in the bye-products of the coco-nut palm can very easily be developed on Patta Island, whilst the increased value of the trees would go a great way to check the present practice of excessive tapping for toddy, which tends greatly to weaken and kill the trees.

In the afternoon at 3 p.m. I left for Faza, this time following a more direct route, across the creek, through which I was carried by my porters, as it was high tide. On the other side I continued in a N.N.E. direction, and after half-an-hour's march passed by Koyo, the Siyu harbour, the dhows being distinctly seen from the path.

The sea continued closely on my left less than a quarter of a mile away. The country was well cultivated, mostly with ground produce such as metamah and beans, the land being quite open, and the fields extending far away on my right. The soil was of a light brown to reddish-coloured loam.

At 4 p.m. I crossed a creek thickly fringed with mangroves, with a low ridge beyond running north-west and south-east, which the path eventually skirted, the top of the ridge and the whole country on my left being fairly well cultivated. Where not cleared, the ground is covered with thick thorny scrub and fan palms. Much the same description of country continued till I got close to the Faza coco-nut cultivation. When passing a hole about 5 feet deep I examined the soil

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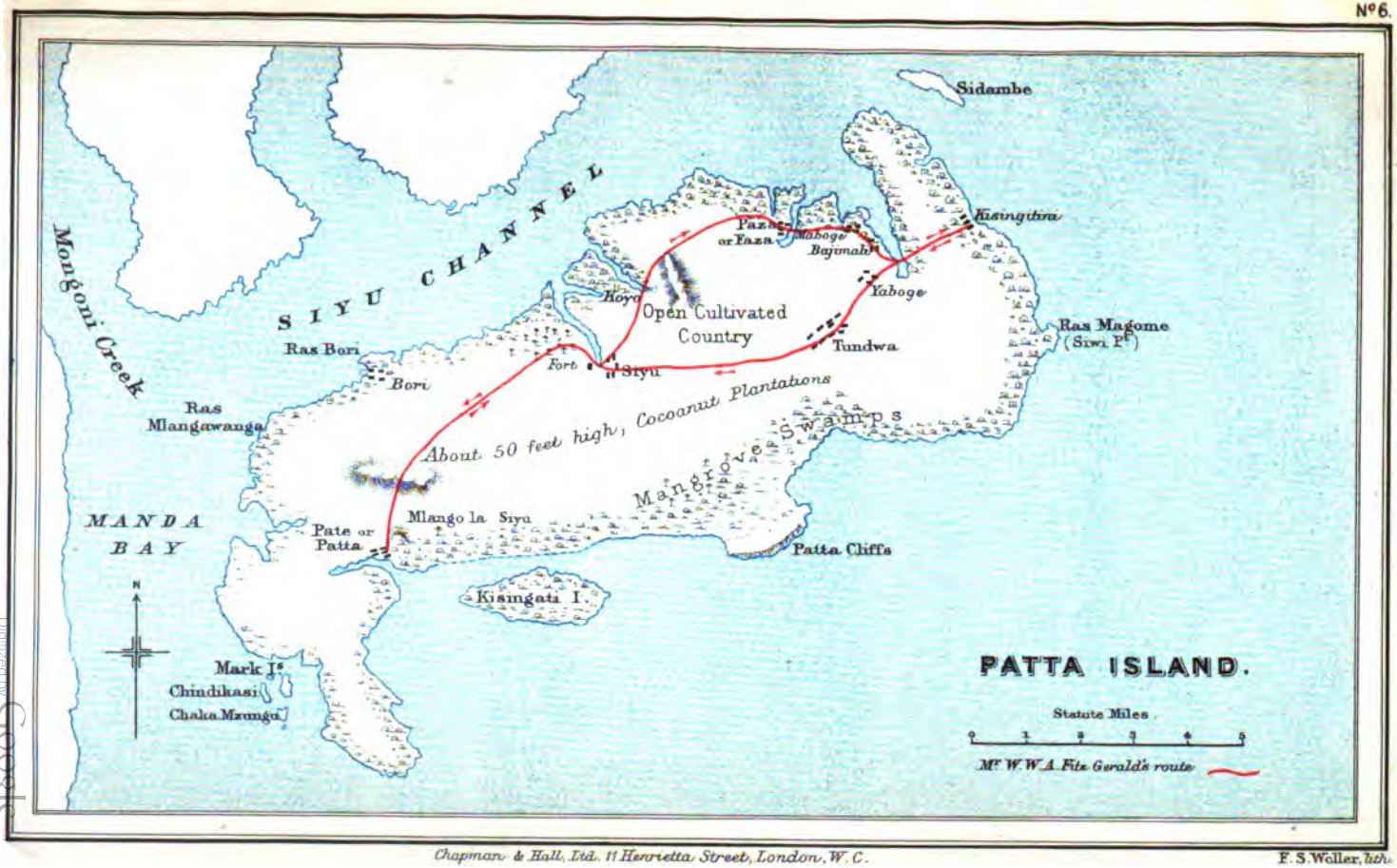


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F.S.Weller, lith.

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formation, which was red sandy loam mixed with sandstone, very light and friable, the surface loam very sandy. I reached my old camping-place in the coco-nut shamba at 5 p.m., having taken roughly about two hours to travel across from Siyu.

I was disappointed to hear that a dhow, which had been faithfully promised by Mze Saif's son, and which ought to have been waiting to take me on to Itembe, had not even been got ready. I had to resign myself to spending another day in Faza. I was still very seedy, and did not like to touch the water here, so I was reduced to milk and eggs. The next morning I was repeatedly told that the dhow would be ready punctually at three in the afternoon, so I spent the forenoon in visiting the bazaar again, and, with half the village at my heels, calling to see the sick man I had visited before, who was very ill with inflammation of the lungs. I did what I could for him, but I fear he wanted more skilful help and advice than I could give him.

By 2 p.m. I had got my tent and all my gear packed up, only to discover that, after all, the dhow would not start until the next day. My whole stock of patience was needed not only to meet these various mishaps, but to contend against the grasping, and really at times exasperating, character of the Bajoni people. Young Mze Saif became a great nuisance, wanting everything he saw; I had also to stop giving medicines, as the constant stream of people clamouring for them became overwhelming, and I had only a sufficient supply for our own needs.

There was nothing to be done but to re-pitch my tent again and hope for better luck to-morrow.

The thermometer readings this day were as follows—

Patta, 6 a.m., 76° in the shade.
Siyu, 11 a.m., 85° „ „ „
„ 2 p.m., 88° „ „ „
Faza, 6 p.m., 82° „ „ „

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## CHAPTER XXI

### FROM PATTA ISLAND TO LAMU AND MOMBASA

Off to Itembe—Mze Saif the Bajoni Chief—Hostile Attitude of the Wa-Siyu—Mattaroni—Bajoni Cotton Cultivation—Native Elephant-hunter—His Description of the Unknown Country—The Rainy Season—Renewed Difficulty in getting away—Sail for Wange—Round the Mongoni Creek—The Pokomoni River—An Arduous Day's March—Tangave—M'Gini—Lake Béré Béré—Lamu—A Long Overland Tramp—A New Experience—Magarini once more—Mombasa.

I WAS up before daylight on the morning of March 15, and after all my gear was packed we went off at once to find the dhow. No one came to say good-bye, and I cannot say I was sorry! We marched through the still sleeping town, and the tide being still out we were able to walk a long way through the mangroves towards the dhow, my porters eventually wading out to it. I went in a small canoe which Mze Saif's son Salim bin Saif, who was accompanying me to Itembe, had got for my use.

The dhow left at 6.20 a.m., my porters raising a cheer. I think they were as delighted as I was to get away, and had begun to believe that with these constant delays there was a plot to keep us against our will. Passing the point (thickly overgrown with mangroves) to the north-east of Faza, we coasted close by the western side of Sidembe Island, obtaining as we passed a good view of the village of Kisingitini; we then headed northward for Itembe, the sea being beautifully calm with a favouring breeze, till presently Kwaihu Island, with its low hill, a conspicuous object, 155 feet high, rose in sight on the right, the island appearing quite devoid of cultivation. Then Fazi Island



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appeared close on our left, its small village called N'Dau (not Fazi as given on the maps) plainly visible with its background of Hyphæne palms, and two dhows lying at anchor in front of it. Running past these we entered a creek thickly belted with mangroves, and disembarked at Itembe landing-place at 11.45 a.m., Itembe itself being only five minutes' walk beyond.

Itembe—the head-quarters on the mainland of Mze Saif, the chief of the Bajoni people—is a village lying on a narrow sea-creek facing the mangrove swamp and surrounded by a flat sandy plain—the cultivation being at some distance. In the distance a ridge of low hills called Mundane is discernible running from east to west. Proceeding to the chief's house to deliver the letters I had brought with me, I was informed that he had left a message requesting me to await his return next morning, when he would give me people to take me wherever I wished. This conduct of Mze Saif's was not very courteous, for knowing I was coming he ought to have been present to receive me, but having no guides I had no option but to await his return.

Wishing to be as far away as possible from the muddy mangroves I made my camp near some water-holes lying S.S.E. of the village, about 200 yards away. These water-holes were fed from surface springs, the water percolating through the light sandy soil, so I pitched my tent under a small tree close by.

I took a walk in the afternoon towards the S.S.W., and remarked that the soil in the open country beyond the mangroves was of a very light sandy nature, whitish to grey, becoming much darker when damp; it was of great depth, the subsoil being all of a light grey colour. The country was very flat with scattered low thorny scrub and numerous thick clumps of fan palms. The shambas were some little distance from the village; I noticed one small shamba with a few young coco-nuts just planted, but, with the exception of these, the cultivation was all ground-produce, consisting of "wembe" (raggy), metamah, sim-sim, and a little rice.

The people here are all Bajoni, with the exception of a few Swahilis.

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The village Akida came to tell me in the evening that as Mze Saif was going to burn his shambas he could not now come till the evening of the next day!

The thermometer readings that day were—

| | | | |
|---|---|---|---|
| Faza, | 6 a.m., | 76° | in the shade. |
| Itembe, | 2 p.m., | 90° | „ „ |
| „ | 4 p.m., | 88° | „ „ |
| „ | 6 p.m., | 82° | „ „ |

Small gnats or midges, probably bred in the mangrove swamps, were exceedingly troublesome both in the evenings and mornings—rendering all reading or writing at night almost impossible by their incessant stinging, and continuing in the morning till the sun was well up.

A letter came next morning from Mze Saif, saying that he would come in this evening, and that all the *Waze* or headmen of Mattaroni were with him. The Akida, who brought me this news, further mentioned that Mze Saif had from 400 to 500 men with him clearing his shambas. I saw the burning of these in the afternoon, and judging from the volume and distance apart of the enormous columns of smoke, the clearings must have been very extensive. The burning had only been done just in time, as a very heavy shower of rain came on shortly afterwards. The shambas were reported to be two hours' distance from Itembe.

I spent the day in exploring the neighbouring country, the characteristics of which may be described as follows—

To the north and immediately round the town, was chiefly open, cleared and burnt land, with many fan-palm clumps. To the west, thick thorn-bush with scattered low trees; the soil here though still very friable was better in quality, and judging from the large shambas being made in that direction, must still further improve, and should be very suitable for the cultivation of coco-nuts, sim-sim, and cotton. Towards the sea the coast is low and everywhere thickly fringed with mangroves, *borities* being largely exported.

Speaking of mangroves, I may remark that the wood makes excellent fuel, and coral burnt with it makes excellent lime.

Game, including lions, was reported to be plentiful in the

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rains, but at present there were only buck and "pah" (a small antelope), both of which were numerous.

On returning to camp I found Mze Saif had called in my absence and left plenty of salaams, and a message that he was too tired to return that evening, but would visit me next day; at what hour was not stated. His young son, the one who had crossed over with me, came to see me in the evening, making himself a great nuisance. Finally he wanted a box of cigarettes, which I declined to give him, upon which, to my relief, he went of in a huff.

The next day (March 17) I at last had an interview with Mze Saif, who came to see me in the morning. He was an old man with a crafty expression of countenance, and is a typical Bajoni. The interview was not satisfactory. My letters to Mze Saif requested him to afford me every facility for visiting this part of the coast, and on the completion of my visit to give me the necessary escort through the country to the south on my way back to Lamu.

He told me, however, that the Siyu people on the mainland to the south were at this moment very hostile in their attitude, owing to a quarrel which had arisen between them and Fumo Omari, the rebel Sultan of Witu; and that he dared not take the responsibility of sending me through their country, as I might very probably be seized as a hostage. He suggested that I should at present only visit Mattaroni, about four miles to the westward, where cotton is cultivated, and that afterwards he would send me down by sea to Wange; he said that doubtless in a little while everything would settle down and the country become quite peaceful again, when I could return and go wherever I wished, and that he would be only too glad to help me by every means in his power. Every argument I could bring forward could not shake his resolution; I was quite helpless, for if Mze Saif would not give me an escort it was useless for me, with my small party, and only three rifles, to push southward alone, so I had reluctantly to give way for the present, resolving however to return better prepared another time.

I arranged therefore to go at once to Mattaroni, Mze Saif promising to send two of his men to guide me there.

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It took me an hour and a half to reach Mattaroni, following the zigzag native path winding in and out through creeks and mangrove swamps, with a good deal of wading to be done. The glimpses I got of the country inland showed me a low, flat plain covered with bush and grass, scattered low trees, Hyphæne, mimosa, and one or two baobabs, the soil being a sandy white to yellow.

Mattaroni is situated on the western side of a line of low sandy hills extending between it and the sea-shore, from which it is only five minutes away. The ridge runs from north to south, extending for half-an-hour's walk beyond the town, and forms a noticeable feature in the surrounding flat landscape.

The village is small, with not more than sixty to seventy inhabitants; it is built on a small area of red loam, on which a fine tamarind tree was growing. The walls of the houses are red-coloured, but all the surrounding soil is a white to grey sandy loam, the low ridge being composed of a dazzling white sand. The water supply is excellent, the water welling up pure and clear through the sand. A well on the outskirts of the village yields a brackish water, and is only used for washing. The absence of mangroves and the fine open sandy beach make Mattaroni a very salubrious place—in marked contrast to Itembe with its muddy mangrove swamps.

The chief cultivation of the people about here is *Cotton*, which they sell at Lamu to Indian merchants at the rate of $3 a frasila (roughly 3*d.* a lb.). I saw cotton drying in front of many of the houses, and women busy occupied in cleaning it with primitive ginning machines, with which they are able to clean one large basketful of lint-cotton a day. Cotton cultivation was reported to extend all the way to Kionga, between which and Mattaroni, nine Bajoni villages were said to exist.

The same afternoon, accompanied by my two Bajoni guides, I set off to visit the country round Mattaroni, and more particularly the cotton shambas which I was very anxious to see.

To the northward of the village lies a low flat valley which becomes a swamp in the wet season; it is surrounded on all

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sides by a plain covered with low bush and thick clumps of fan palm. On the right of this swamp, and not very far from the village, I came upon the first cotton shamba, about 3 to 4 acres in extent. The cotton bushes had very minute leaves (five-lobed). The flowers were yellow with a purple tinge, the opening pod had three capsules, and the staple of the ripe cotton was short and very strong. The bushes were growing very close together, long and straggling, about 7 feet high, with numerous whippy upright branches with very few leaves then ; this cotton-field was said to be four years old. The soil was a very light grey sandy loam.

Leaving this shamba we presently passed into thick low thorny bush, amongst which I remarked numerous shrubs bearing green orange-like fruit, becoming yellow when ripe. I had also noticed them growing near Lake Krawa. The Bajoni call the fruit "myhi," and are fond of it. My guides pointed out another fruit-yielding tree, its fruit resembling a miniature pear, the green colour of which turns to a purple when ripe ; they called it "tundukwa."

We continued for over an hour through this thick low bush (now leafless) in a W.N.W. direction, passing here and there a cotton plant growing wild among the bush. The soil, which at first was very white and sandy with a light yellow subsoil, had latterly become a light grey. Then after going through an old cotton-field, in which the plants had grown into a regular bush tangle fully 6 feet high, I came upon the shambas of the Mattaroni people, where they cultivated metamah, sim-sim, and cotton.

The method of cotton cultivation adopted by these people is as follows—

They first open up the land, burn it, and sow metamah—or, as they pronoune it here, "machamah." When this is reaped they sow cotton, which continues on the land untouched for a period of four or five years. The yield by this time having become greatly reduced, they cut the cotton down and burn it. They do not re-sow the field, but allow the cotton-seed, which lies thick on the ground, and which apparently is not affected by the burning, to spring up again ; this it does as soon as

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the rains commence. This second crop of cotton continues also for a period of three to four years, and when too thick, whippy, and bushy, is cut down and pruned. They then calculate on a further period of two or three years for this crop; so that, roughly speaking, it appears that cotton will stand in the same field—the first time, sown; the second time, burnt; and the third time, pruned down—for a good average of ten years.

They appear to gather the cotton as soon as the heavy rains of both the S.W. and N.E. monsoons have ceased—say twice a year. The old cotton seen by me and stated to be four years old was very bushy and whippy, with but few pods, and I was especially struck with the smallness of the leaves. I passed over a succession of shambas all small in extent, two acres being the greatest size. In one field of cotton the plants were old and thick-stemmed, and in another were young and only 3 to 4 feet high. The cotton is not topped or pruned—it appears to be its nature to grow up with bushy and whippy branches. The staple is very white and free from stain, and when fully ripe hangs in a festoon from the capsule, from which it is very easily detached. The seeds, however, adhere very firmly to the cotton. Weeding is the only process employed, apart from clearing and sowing the land.

After gathering, the cotton is simply dried in the sun, and the seeds—which, as just stated, are very tenacious and hard to remove—are cleaned out by means of a small wooden implement, costing one rupee three annas, and called "kitoko"; each house in the village possesses two or three of these. The "kitoko" consists simply of two sticks placed in a small frame, and turned in opposite directions by means of a wooden handle at each side. The cotton is passed through the sticks and the seeds drop below; the cleaned cotton being picked off by the hand as it becomes loosened. As I have already mentioned, it is posible to obtain in a day from one of these machines one well-filled basket of lint-cotton. I brought home with me several samples of this cotton, and the following is the valuation made upon it by Messrs. William Bower and Son—

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| "*Description.* | *Price.* | *Classification.* |
|---|---|---|
| No. 2. Native short-stapled cotton from Mattaroni, coast-land north of Lamu.<br>No. 5. Native short-stapled cotton from Mattaroni, coast-land north of Lamu, cleaned by native ginning-machine. | 3½*d.* | Very poor stuff, dull, rough, uneven, and native ginning bad, probably worth 3½*d.* per lb. |

*London, November* 6, 1893."

Taking into consideration the primitive methods of cultivation and of preparing the cotton, the above somewhat unfavourable report is hardly to be wondered at; but being known the faults can be corrected, and given better skill and knowledge, I am confident that better results will be obtained, bearing in mind the suitability of the cotton-plant to the country, and above all the marked similarity of the soil to that described as characteristic of some of the leading North American Cotton States.

Sim-sim was cultivated to a small extent, one reason given for the comparatively small area under cultivation being that the people were compelled to furnish labour for Mze Saif's shambas; and when I was there nearly all the men were away thus employed. If the people were free to cultivate for themselves, no doubt a great impetus would be given to agriculture.

I returned home another way, taking exactly one hour from the last shamba visited to the village, and passing through much the same variety of country: I got back to camp at 7 p.m. The night was a lovely one, and after dinner I climbed up to the top of the ridge above the village, and sat a long time enjoying the cool sea-breeze and watching the waves; it was such a treat to be on a fine open beach again, without those everlasting mangroves.

One of the head-men given to me as a guide by Mze Saif was, it appeared, an elephant-hunter by profession, and he had just returned from a successful hunt in the country to the

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westward, having managed to kill four elephants. On my questioning him about the country in that direction, this was the account he gave me—

Bush country, with black to grey sandy loam—excellent for cultivation—extends for two days' journey westwards. Then thick forest succeeds, with large trees that quite shade the ground, the undergrowth consisting almost entirely of n'konge aloes, together with the other thick-stemmed variety, with short, sharp-pointed leaves, of which I have already spoken. The forest extends from Jongeni to the Juba river, and takes fully six days' hard marching to get through.

The elephant-hunter carries only his gun and a little food, and marches from sunrise to sunset. Calculating therefore his rate of progress at probably over twenty miles a day, the forest must be fully 100 miles in depth!

This forest is also said to be very rich in indiarubber; the Mattaroni people go up in the wet weather to gather it, and, though they do not penetrate far into the forest, it takes them three days to reach the place.

Beyond this forest is an open plain with low bush and grass, generally burnt in the dry weather either by the Somalis, the Wa-Boni, or the elephant-hunters. This open plain extends for days in every direction, reaching to the Pokomo country on the one side, and the Juba river on the other; it teems with game of every description. My informant said he saw forty giraffes in one day, and elephants also are very numerous. The plain consists of good soil suitable for shambas. Water, to the man's knowledge, does not exist, except in rain-water holes, and wells near the villages of the Wa-Boni, Gallas, and Somalis, who are the inhabitants of the country. The Gallas live in the forest, in villages of about 100 people, and are prevented by fear of the Somalis from keeping cattle. The Wa-Boni cultivate in small patches near their villages, which, I understand, are not permanent.

The country between the sea and the forest is reported to be all bush, getting thicker as you proceed, and the soil is light, friable, and good—especially so as you approach the Mundane Hills; beyond this it is described as black and sandy. Ebony is said to be plentiful in the forest, and large

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trees are stated to exist. As to aloes, "kikumbe" (the short and sharp-leaved variety), n'konge, and a larger kind, probably *Sansevieria*, are reported as growing in this forest; the last are said to be the most plentiful. The plants are about 4 feet high, the leaves 3½ feet long by 4 inches broad, and are said to be found in white sandy soil. The soil of the forest is a very friable black loam—"*mtanga neussi*" is the expression, meaning literally *black sand;* and it is in this the n'konge and "kikumbe" are most plentiful. The indiarubber vines were described as very plentiful and very thick; but this product exists principally to the southward of a line drawn through the forest from Mattaroni—to the northward, towards the Juba, it is comparatively scarce. One lake, or large swamp, is reputed to exist, situated a good three days' march from Mattaroni, in a north-easterly direction, at the end of the low hills or ridge of Mundane. In the dry weather it takes an hour to walk round it, and it is said to always contain water to a depth of 4½ to 5 feet. In the wet season it takes two hours to go round it. This lake is called M'Bawe.

This man, Bwana Siri by name, had been up to Kismayu overland, and said the Bajoni were to be found nearly up to the Juba river; his own village, Shakan, being some distance beyond Kionga.

Next morning, March 18, I visited another cotton shamba just outside the village, in which the plants were young, but as usual growing too close together; the soil was a very light sandy loam. A heaped-up "kikapu," or basket of cleaned cotton, and another of uncleaned, which I had asked for to take away as samples, were sold to me for half-a-dollar (about 1*s.* 6*d.*).

I started back to Itembe the same afternoon; I liked Mattaroni very much, and was quite sorry to leave it. We returned by the same path by which we had come, but about half-way, the tide being at the flood, we struck off through the bush in order to avoid the mangroves, travelling latterly over the flat plain through bush-mimosa and fan palms. This way was much shorter, and it only took me one hour and twenty minutes to reach my old camping-ground near

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Itembe, where, what with the midges and a black-bodied insect resembling a flying ant, whose sting was most acute, I passed another rather unpleasant evening. I had to have a green-wood fire made around me, and eat my dinner surrounded with smoke; the remedy was nearly as bad as the annoyance it was meant to allay.

There was very heavy rain in the night, and the morning broke dark and threatening, with distant thunder, showing the rainy season had well set in. I noticed that after the night's rain the whole of the white to grey sandy soil had become much darker in colour, the subsoil especially so.

There was no word yet of the dhow promised to take me to Wange, and after another wretched evening with the insects—made doubly troublesome and lively by the rain—I waited another day with a like result. The setting in of the rains had made the temperature much cooler, as the following thermometer readings will show; the wind was now blowing from the S.W.

6 a.m., 76° in the open.
10 a.m., 86° „ „
2 p.m., 87° in the shade.
6 p.m., 81° „ „

I was greatly vexed at this renewed delay about the dhow, and was far from blessing Mze Saif; my porters came to me in the evening, and said that if I gave the word, they were ready to march southward or anywhere else I ordered; so on the morning of the third day I sent a message to Mze Saif to say that if the dhow did not arrive that day, I would start early next morning on a march overland to Lamu, and that if anything happened to me the responsibility would be his. This had the desired effect, for it brought the old man hurrying up with the news that a big dhow had been sighted, and that it would be in the creek in the evening, so that I could start as early as I wished the following day.

The dhow arrived, and I sailed the next morning for Wange; it had been built at N'Dau, and resembled a Madras masulah boat—the planks being sown together with coir-rope, with another layer of rope placed over each join of the planks.

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All the Bajoni dhows are also distinguished by their large square sail made of fan-palm matting.

It took us nearly two hours to beat out of Itembe creek, so that I obtained a good view of Kwaihu Island, with its low hill, bare and brown, bearing east-south-east of Itembe, and of the smaller island of Fazi on the other side.

Kwaihu Island is entirely composed of low sandy ridges covered with scrub, with four small islets stretching out at its southern end. Fazi Island is reported to be very healthy, and its small village of N'Dau, situated on a white sandy beach, presented quite a picturesque appearance, with its background of low trees and Hyphæne palms; dhows are apparently built there.

I arrived at Wange at 5 p.m., after nine hours' sail.

Wange is situated on the Mongoni creek, which really might be called a bay. The village itself is a mere cluster of huts, and derives its importance from the house and plantation of Herr Denhardt, a German gentleman much connected with Witu and its affairs in former years. Herr Denhardt instructed his overseer to show me every attention, and I stayed for the night at his house, a most comfortable one.

Beside Sea Island cotton, a large coco-nut plantation had been opened here, which promised so well that it was proposed to extend it.

Having heard that important letters were awaiting me in Lamu, I postponed inspecting the plantations until my next visit; but wishing to see as much of this part of the country as I could, I resolved to travel down from here to Lamu overland, and to make Tangave, situated on the opposite side of the creek, my first halting-place.

Starting the next morning at 9 a.m. with two guides, we first passed through Wange village, surrounded by banana clumps, and westward of which I was told there was a good deal of cultivation. Our way led along the edge of the sandy creek, belted with thick mangroves, and we shortly afterwards crossed a narrow back-water running in from the larger one, called Pokomoni creek. The landward side was at first fringed by white sandy cliffs, 8 to 10 feet in height, sloping gradually down to the level plain, which appeared thickly covered with



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low bush and scattered Hyphæne and fan palms, with a grey sandy surface loam and a yellow to red subsoil. After more than an hour's tramp, or a good three miles from Wange, we, to my great relief, came to the end of the mangroves. I called a brief halt, for the guides had been going at a smart pace, and shut in as we were from every breath of wind the heat felt quite stifling.

It was now ten o'clock, and leaving the creek, which continued in a S.W. and south direction, we struck inland, the path going due north through open forest, with glades of fine short grass and a fertile soil of blackish-grey loam, altogether a good grazing country, and one in which game appeared to be abundant. This fine country was after all only a point of land running into the creek, for at 10.30 a.m. we came upon the creek again, having to slide down a steepish descent of about 12 feet to get to the shore; the land everywhere rising steeply from the creek as we once more proceeded on our way along its flat sandy shore and thick mangroves. Judging from the brief glimpse I had just obtained, this part of the country must be rich and fertile.

At 11.30 a.m. after another brief halt we started again. The tide being out, we were able to cut off many a long corner, though we had a good many pools to wade through. I noticed numerous tracks of both buffalo and topi, some of the former being so fresh that I expected every minute to come upon some of these animals. The mainland on this side alternated between Hyphæne palm forest and open grass glades with thick low bush, but always on a higher level than the sea-creek, often rising abruptly with white sandy cliffs 7 to 8 feet high, or else low grass ridges. We had been travelling westward for some time, when at 12.30 the close steamy heat made me call a third halt, for I felt quite done up. However, a couple of biscuits, a drink of water, and half-an-hour's rest quite refreshed me, and starting again at 1 p.m. I was pleased to see that the guides had begun to turn due south, and after a short while we came upon the Pokomoni river, here tidal, and flowing into the Mongoni creek. The river has a wide bed, and was about 4 to 5 feet deep. I understand that the name of this river is due to the

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fact that the Pokomos were settled here at one time; they are said to have come down from the north (Juba river?) about 300 years ago, probably driven southwards, like the Gallas, by the Somalis.

On the right bank of the river extends an undulating country, the ridges covered with bush; we here gladly welcomed the sight of a small rain-water pool, and the opportunity to re-fill our bottles. We then pushed on, following the course of the winding river, crossing and re-crossing it several times, our direction being S.S.E., until we came out once more on the Mongoni creek, which opened out very widely here. The tide was now coming in, but we succeeded in getting across, the water only coming up to our middles. Leaving the creek finally behind us, Wange lying exactly in a straight line to the eastward across it, we struck off in a S.W. by W. direction, over a low flat plain, till at 3 p.m. we sighted the ruined village of Tangave, the houses all destroyed and deserted, and one solitary coco-nut and a few silk-cotton trees alone remaining. Fumo Omari and his lawless followers were responsible for it all.

I camped near a water-hole, the water of which though much discoloured was good. Just above the old village there was also a small swamp. All around lay the open plain, which after the recent rains looked green and luxuriant. Buffaloes and buck, my guides told me, were numerous about here, and this was verified at nightfall by several lions roaring around us all night. It had been a tiring day, for I had left Wange at nine in the morning, and arrived here at 3 p.m., so that, deducting an hour's time lost in halts and crossing the river and creeks, it left about five hours of marching, which at the rate of, say, two and a half miles an hour, gave a total of nearly fifteen miles traversed that day, mostly along mangrove swamps.

The next morning, March 23, I resumed my march southward, my two Wange guides accompanying me. We passed through the old abandoned shambas of Tangave, where a good many bananas were still growing.

The country, at first park-like with numerous baobabs and a good grey loamy soil, gradually shelved downwards till at

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about two and a half miles from Tangave I found myself amongst mangroves again, and crossed a shallow back-water about 2½ feet deep, which I had noticed for some time on my right running up from the south-east. On its flat, sandy shore were numerous tracks of both lions and buffaloes evidently quite fresh and recent. Beyond the creek the land rose to a higher level, forming an open plateau covered with bush, grass, Hyphæne, and fan palms, with a good grey sandy loam. At 9.20 a.m. I arrived at M'Gini, six miles distant from Tangave.

M'Gini is a large straggling village situated at the mouth of the sea-creek I had crossed higher up, and inhabited by Patta and Lamu people. It was surrounded by some fine coco-nuts and banana clumps and large mango trees.

Rain appeared to have been plentiful everywhere during the week, and the fields and vegetation were looking green and luxuriant. The shambas of the M'Gini people lie more to the southward, and consist entirely of ground-produce: with the exception of those growing round the village, no coco-nuts appear to be cultivated.

I took the opportunity of the visit of the village elders—all Arab cultivators—to my camp to question them about the country extending to the westward. They told me that there was forest land about four hours' march from here, that it is about six miles in extent, with large trees, and indiarubber plentiful; beyond it an open plain with bush extending on every side. They assured me that this description could be depended upon. From another source I learnt that about fifteen miles to the north-west there is a swamp with only pools of water in the dry season, but which in the rains forms a lake which has no outlet to the sea, "and has a tail to it," as my informant expressed it. Game of all sorts, buffaloes, lions, and elephants, was reported numerous to the westward; on my way here I noticed elephant-tracks in the bush. There were some heavy downpours during the day, the temperature being as follows—

| | | | |
|---|---|---|---|
| Tangave, | 6 | a.m., | 76 |
| M'Gini, | 10.30 | a.m., | 88° in the shade. |
| „ | 4 | p.m., | 88° „ „ |
| „ | 6 | p.m., | 82° „ „ |

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My tent was pitched under a large mango tree just outside the village; the wind from the sea was fresh and cool, and I thoroughly enjoyed a quiet day on this breezy open plain after my long sojourn amongst the mangrove swamps.

I started the next morning at 7 a.m., and it took me a good twenty minutes to cross M'Gini creek; on the other side there was a fine open stretch of country with cultivation here and there, the natives being busy clearing land and sowing metamah.

At 7.45 a.m. I reached the village of Masogoni, with some small mango and coco-nut trees growing about the houses, surrounded by open cultivated country with an excellent grey loamy soil. The products cultivated were millet, raggy, beans, and sim-sim; the absence of coco-nuts being here noticeable. Leaving this cultivated area, the path now led through thick Hyphæne palm woods, open grass glades, baobabs, and thick clumps of fan palms for about three miles or so, when I emerged again on an extensively cultivated country, chiefly metamah fields, in some of which the plants were already 6 inches to 1 foot high; the country was exceedingly flat, with a good friable, loamy soil. Three Swahili villages are situated here, two of them, Hindi and Jipe, lying opposite to each other, with a large swamp or lake called Béré Béré between them; whilst the third village, Semandato, is some little distance away at its southern end.

Béré Béré lake is fringed by reeds and rushes, and its water is fresh and good. There are no crocodiles, but in the northern end, where the water is deep, there are said to be hippo. The surrounding country was all open, and mostly cultivated, these being the Lamu shambas; numerous goats (but no cattle) were grazing about, the short grass providing an excellent pasturage. There were no coco-nuts, and all the mango trees, except some fine large ones near Jipe under which I was camped, were young. Baobabs were numerous, and everywhere the soil appeared to be excellent.

In the afternoon I resumed my journey to Lamu, proceeding northward to Makowe Ferry, some four and a half miles distant. Close to the village of Semandato I passed two small streams, or channels, which run into the lake; one had been

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dammed up in connection with rice cultivation, for the people from Patta came over to the mainland regularly to plant rice, and this property connection between the people of the island and the Witu country has existed for a long time.

The country between this and the sea was undulating to flat, with bush and open grass patches. Approaching Makowe village the sand-cliffs of Lamu could be seen distinctly ahead. Passing this village and its small area of cultivation with

LAMU MARKET.

some fine mango trees near the path, I reached the ferry at 4 p.m. It took me an hour to get my men and loads across, and we arrived at the town of Lamu at 6 p.m. Here I found Mr. Rogers, the Company's officer, who welcomed me, and made me most comfortable in his house.

I here found letters awaiting me from the Administrator, instructing me to visit and report on the district of Wasin and the country south of Mombasa; I was then to return and complete my exploration of the coast-land up to Port Durn-

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ford, and finally visit Kismayu and the runaway-slave settlements of Gosha, situated on the Juba river.

I heard to my dismay that the Company's steamer *Juba* in which I had hoped to go down to Mombasa, had left some days before, and as, with the present contrary winds, a journey by dhow would be too long and tedious, there was now nothing to be done but to march down overland!

I remained in Lamu for two days, and then started on my long tramp southward, leaving for Kipungani on Monday, March 27, at 7 a.m. After a very tiring march through the deep white sand, passing but very little cultivation—indeed there seems hardly any in the centre of the island—I reached Kipungani with its steep sandy ridges at 9 a.m., and here embarked in a small dhow for Kimbo, which I reached at 12.30 p.m.

Kimbo village is situated at the end of a long winding creek thickly surrounded with mangroves, and as we slowly punted our way up, I thought how well coco-nuts would grow in the rich muddy banks of this extensive mangrove swamp.

The heat was so great that, by way of a change, I resolved on a night march to U'Kanga; the announcement delighted my porters. I told them all to get what sleep they could in the afternoon, and that we would start after their evening meal. Accordingly, at 9 p.m. we started on our way in brilliant moonlight, as bright as day, taking two guides with us from Kimbo. Leaving the village, which has a great many fan palms growing round it in the usual grey loamy soil, after an hour's march, which was wonderfully cool and pleasant, we passed through the cultivated land and houses of the village of Bandani, whence to M'Pekatoni the way led through Hyphæne palm forest, interspersed with open glades, in places cultivated, and some low swamps. We arrived at M'Pekatoni at 11.30 p.m., and halted here for twenty minutes near a water-hole: we could hear the hippo bellowing in the lake. As we resumed our march it became very hard work, since latterly, the moon having disappeared, it became very dark, and my one lantern did not help us very much. The high grass had completely overgrown the path, and it was very difficult to follow; we constantly lost it, and, as both the grass

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and the undergrowth were saturated with moisture, we got drenched through and through. Frequent halts were necessary to allow stragglers to come up, and once some excitement was caused by a deep growl and a rustling ahead, probably due to a leopard. After this little episode all the porters kept up most beautifully!

We reached my old camping-ground at U'Kanga at 3 a.m., and as soon as my tent was pitched I had some supper and hot cocoa and went to bed, sleeping till nine in the morning. The same afternoon I left for Kipini, arriving there at 5.15 in the evening.

The temperature during this day was as follows—

| | | |
|---|---|---|
| U'Kanga, | 10 a.m., ... | 83° |
| | 12 noon, ... | 82° (Heavy rain and thunderstorm) |
| | 2 p.m., ... | 88° |
| | 3 „ ... | 88° |
| Kipini, | 6 „ ... | 81° |

The next day (March 30) much time was wasted in waiting for the ferry-boat to cross the Ozi river, and I passed the time in trying to stalk some hippo in the river. The ferryman could not be found, so I got my porters to launch the boat—and very leaky it was—and we paddled ourselves across. It was nearly ten o'clock by the time every one had crossed and we had started along the sea-shore for the mouth of the Tana river. Marching was very pleasant and easy over the splendid flat sandy beach, fringed all along by low white sandhills, which were covered with low green vegetation and thick fan-palm clumps.

We reached the mouth of the Tana river at 5 p.m., having taken six and a half hours, resting one hour on the way, to do the twenty miles from Kipini.

There were a lot of crocodiles swimming about the river, and I shot a large one while my porters and loads were being ferried across, the ferry-boat being a small canoe only capable of holding six people at a time. I camped on the other side of the river, the banks of which are flat and sandy. The river-water becomes quite fresh and drinkable as soon as the tide has gone out.

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AFTERNOON TEA AT MAGARINI.

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On Friday, March 31, I resumed my march, starting at 5.45 a.m. for Marereni, sixteen miles away, where I proposed to camp. We continued over the same fine open sandy beach and low coast up to the Kilifi river, which, like the various other creeks passed over lower down, was thickly fringed with mangroves. Arriving at Marereni at 1 p.m. I camped for the rest of that day, the place being now quite empty of orchella-weed gatherers.

THE ADMINISTRATOR'S HOUSE AT KILINDINI—MOMBASA.

The temperature this day had been as follows—6 a.m., 78°; 1 p.m., 86°; 5 p.m., 85°; 6 p.m., 83°.

*Saturday morning, April* 1.—I started for Gongoni, travelling over the well-known path at a great rate, my people being very keen to get home and see their wives and children after their long absence. I am pleased to mention that they had never given me cause for a single complaint from the day we had first started. Reaching Gongoni at eleven o'clock, I remained there till the afternoon, when I set off for Magarini. I found Weaver quite well, and he reported that all had gone on satisfactorily on the shambas.

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Various matters detained me here till April 4. The day before my departure for Mombasa, Weaver shot a wild dog, called by the natives "*Umbwa a mitoni.*" Our people were in a great state of mind when they heard of it. They said these native dogs, which always hunt in large packs, were so fierce and savage that even lions were afraid of them, that they would be sure to return at night to attack us in revenge for the death of their companion. We laughed at this, but none of our servants would stay near us that night. We were living in a temporary hut outside the village.

Sure enough, shortly after we had turned in, we heard the brutes howling, at first a long way off, but gradually getting nearer; we jumped up, and taking our rifles and a lantern ran outside. The wild dogs, about thirty in number, set up a big howling on seeing us, but, to my relief I must confess, they began to retire into the bush. It was too dark to see them clearly, but they were very close to us at one time. The one Weaver shot was over 2½ feet high, with a shaggy, massive head somewhat resembling a hyæna's.

There was a heavy fall of rain during nearly the whole of this day, amounting to nearly 2½ inches.

*Tuesday, April* 4.—After a hearty good-bye from Weaver, whom I was not to meet again in Africa, I started for Mombasa, my route being briefly as follows—I camped the first day at Melindi; the second day, April 5, at M'Shaka, the temperature during the day being—6 a.m., 73°; 2 p.m., 86°; 4 p.m., 82°; 6 p.m., 80°; this being an average record for this time of the year. On Thursday, April 6, I reached M'Tondoa, pushing on the following day past Takaungu to the small village of Makonde or Makenda, about five miles beyond. Beyond this I followed the coast-line, travelling over a fine fertile plain, but sparsely cultivated, and passing successively the villages of Kurwitu, Kijipoa, and Shima la Tever. Camping close to the last-named on Saturday, April 8, I reached Mombasa on the afternoon of the following day, five days after my departure from Magarini. I gladly accepted the kind offer of Mr. Pigott (the Acting Administrator) to put me up at his comfortable house at Kilindini, where, after my rough experiences, I seemed to be in the very midst of luxury!

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MY LAST GLIMPSE OF MAGARINI PLANTATIONS—PEACE AND PROSPERITY.

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## CHAPTER XXII

### EXPEDITION TO PORT DURNFORD

A Tedious Delay—A Lion Hunt—Off at last—Organizing my Caravan—German Plantation at Wange—Development of the Country—The Ganda Fly—Indiarubber—A Fine Rice Country—Native Cotton—The Dodori Creek—A Gadfly—The Dodori River—A Lovely Country—The Mundane Hills—Vaas—A Flooded Land—Camping in the Rainy Season—An Important Conference.

ON arrival at Mombasa, I learnt that the steamer *Juba* was daily expected from Zanzibar, as she had to take up stores and material to the Company's station at Kismayu. This was an opportunity not to be missed, so I decided to travel back in her to Lamu, and from there to start for the Port Durnford portion of the coast, and when that was explored, to return and carry out the remainder of my instructions by reporting on the district of Wasin. Day after day, however, passed without a sign of the *Juba*, first owing to a slight breakdown of her machinery, then from inability to take in her stores, on account of the Arab New Year festivities ; and as each reported new date of her sailing followed quickly in succession, I never felt sure of having sufficient time to carry out my inspection of the southern districts. It was not until the first week in May that I finally sailed for Lamu.

Whilst waiting in Mombasa I had the unusual experience of joining in a lion hunt. The track of two lions having been reported one morning close outside the town, Messrs. Jenner and Hobley, two of the Company's officials, and myself went out after them. After crawling through the bush for several hours, we came upon one lion, which Hobley fired at and wounded. The beast went off into the bush with a roar, and



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darkness compelled us to give up following him further for that day. After my departure, these two gentlemen continued the hunt, and had a most exciting time with the same animal. The native hunters had marked him down in a thick clump of bush, and Hobley getting up to him first, fired and broke his jaw. He turned round to charge, when Jenner fired, and the lion then came straight at him, rose, and fell dead almost on the top of him, his claws actually tearing his coat-sleeve—a narrow shave!

I arrived at Lamu on May 10, after an exceptionally stormy passage, and set about at once organizing my *impedimenta*,

MARKET STREET, MOMBASA.

porters, and supply of food, and the making of these arrangements took up several days. On May 16 I was ready to start, having sent off my porters and loads the day before in a dhow to Wange.

My caravan, as the *personnel* of an expedition is termed in Africa, was composed as follows—

11 Askaris or soldiers, including one corporal.
26 Porters.
1 Head-man (my trusty Dumgu).
1 Interpreter.
3 Servants, including cook and cook-boy. (In all, 42 persons.)

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The larger number of porters taken on this expedition was owing to the fact of having to carry a supply of food for everybody with me, as we should not be able to procure it on the mainland. Besides the askaris, eight of the porters were armed, so that I commanded a force of nineteen guns.

Mr. Rogers very kindly offered to take me to Wange, my starting-point, in the Company's steam launch, and the tide serving at 4 a.m., we were up at three o'clock, leaving at 4.30 a.m. The Liwali of Lamu, who knew the channel thoroughly,

A STREET IN LAMU.

piloted the launch himself. We arrived at Wange at 8.30, landing at 9 a.m.; Rogers and the Liwali returned home after breakfast. I was to meet them both again at Itembe, where we were to have a conference with Mze Saif and arrange the further details of my journey to Port Durnford.

Having mustered my people, I sent them off to the village of M'Kauoni, where I proposed camping, and I remained behind to visit the plantation of Herr Denhardt, a short description of which may prove of interest.



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The estate is situated on a flat table-land bordering the sea, with a few hollows here and there, these lower-lying portions being devoted to rice cultivation—the soil everywhere being of a grey friable loam. The chief products were cotton and coco-nuts, the first having been cultivated for the last four years only. The cotton crop after gathering had been sent to Lamu, and cleaned there by native "kitokos." The variety cultivated at present—after various experiments with other kinds—was Sea Island, in respect to which the American system had so far been followed, viz. that of uprooting entirely after one year. I have already quoted Herr Tiede's opinion (Herr Tiede being Herr Denhardt's partner in the estate), as to the estimated yield of Sea Island per acre, that it will be the same as in America, viz. 400 lbs., equal to one bale of lint-cotton. The proprietors were also experimenting as to the difference between an annual crop after the American plan, and one yielded by pruned cotton; the overseer showed me a small field of one-year cotton which had been cut down two and a half months ago, and close to which a similar plot had been sown with fresh seed. The results of this experiment should be very interesting. Close by, another portion of the estate had been sown with Egyptian cotton-seed, which had just germinated.

Proceeding next to the coco-nut plantation, I was pleased to see the luxuriant and robust appearance of the trees, the oldest of which were said to be six years old, the others ranging from five to four years. New land was being cleared for this cultivation, which it was proposed to largely extend, a large number of young plants being available. The labour required was obtained from Lamu.

Tobacco had also been tried and found to do well; but it had to be given up, for want of skilled labour. Whilst on this subject, it may be interesting to give the results of Herr Tiede's experience with this product.

He found that for the first growing of tobacco in new forest land the soil was too rich, the leaf being too coarse and strongly flavoured; he therefore thought a lighter soil was best.

He had tried Havana, Shiraz, and Sumatra seed, and spoke in equally favourable terms of all three; he had tried to

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produce a superior leaf for the outer wrapper of cigars, but owing to a want of skilled labour he found a difficulty in getting the leaf properly cured. The fact of European planters beginning to settle in this portion of the country is a most hopeful and encouraging sign, and certain to prove of the greatest advantage; first, by calling attention to the undoubted capabilities of the country, for I understand that Wange cotton has not only been most favourably reported upon, but that the quantities shipped to Europe have realized exceedingly good prices. Secondly, by calling native attention to the desirability of cultivating the coco-nut on the mainland, which is as well adapted to it as are the islands of Patta and Lamu, where alone it is grown at present. With Europeans ready to purchase its various bye-products, the natives would very quickly realize all the advantages that would accrue from its cultivation, and its rapid and extended development would then be only a question of time.

Certainly the establishment of a syndicate on this coast, working somewhat on the lines adopted on an Indian indigo farm—distributing cotton-seed, buying the produce and shipping it to Europe—should prove remunerative, and more so when it could combine these operations with the cultivation of plantations of its own. As long as labour is scarce on the coast, supplying seed to head-men, who would induce their people to cultivate it, and purchasing the produce in the manner suggested, would be the best course to adopt.

Questioning the overseer as to the number of cattle to be found here, he informed me that the Ganda fly (referred to in my notes on Witu) was reported to exist up to Itembe, and that consequently neither cattle nor donkeys thrived.

I started for M'Kauoni, three miles from Wange, at 3 p.m., passing into thick bush, which continued for some distance after I had left the plantation. Further on, the country may be described as forest with open grass glades; large trees were rare and of small girth. The lay of the country was very flat and in places low: water-holes were frequent, and I had to wade through many of them. Gradually the country, evidently at one time under cultivation, became more open, the soil the

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usual grey loam till I arrived at M'Kauoni, a village inhabited by Wa-Siyu. The people only live here during the cultivating and harvest seasons, they then return to Siyu. The largest shamba here belonged to Omari bin Issa, at whose house I stayed at Siyu.

I was received with great courtesy by the *Waze* (head-men), but could obtain but little information as to the country inland, which was stated to be all forest, but at what distance

MY PORTERS.

it commenced was not known. Here the cultivation was all grain produce, rice, metamah, and sim-sim, which were grown in large quantities. The harvested grain is sent to Wange, and thence shipped to Siyu.

Indiarubber, I was told, is obtained from the inland forest, but not by the village people, who are cultivators only; gatherers coming up in small numbers for the special purpose of collecting it. The rubber is as a rule sent to Kiongwe,

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which is situated, as the crow flies, three miles away on the Dodori creek, but the villagers of M'Tapa, about a mile off, are greater rubber collectors.

It rained nearly all night, and I started off next morning at 6.25 for M'Tapa, wading knee-deep nearly the whole way through extensive and luxuriant rice-fields, extending on every side over the large flat plain, which, except for the Hyphæne palms scattered here and there, reminded me more of India than anything I had yet seen. Coming next to the shambas of M'Tapa, chiefly producing maize and millet, I especially noticed a small patch of native cotton. They told me that they were growing the cotton as an experiment, and had got the seed from Siyu, but where it originally came from they could not tell. The plants were stated to be a year old and were regular shrubs, most luxuriant and healthy; the bright yellow flowers growing in numerous small clusters.

The small village was just beyond, the inhabitants all Wa-Siyu, for I was now well in the Siyu country. They collect rubber, which they send to Kiongwe. The Waze came out to receive me, but I only halted here for a few minutes, and passed on to Shimbwe.

Shimbwe, situated on a back-water running in from the larger bay which I have named the Dodori creek, contained only twelve inhabitants at the time of my visit. The people of M'Tapa formerly resided here, but moved to their present village as more convenient for cultivating purposes; but all their harvested grain is sent to Shimbwe to be shipped to Siyu. An Indian or Banyan from Siyu had a shop here; he made his principal quarters on the mainland, moving from village to village to purchase rubber and ivory.

I continued along the shore of the mangrove-fringed creek over a flat swampy belt of sand, and about a mile from Shimbwe reached another Wa-Siyu village, called Kiongwe, on the creek, at the foot of a low hill. I camped here under a large mango tree on the outskirts of the village, where I was presently visited by the elders. All the information I obtained of the immediate interior was very conflicting; for here I was told that *they* did not collect rubber, but the M'Tapa people did, and that the latter obtained it from the big forest at the

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back—the only rubber they got themselves was brought by the Wa-Boni, who exchanged it for grain.

I took the opportunity, after this short march, to drill my men in the afternoon, dividing the askaris and armed porters into two bodies, one under the command of the corporal, the other under the interpreter Rashid, who spoke English very well, and proved himself a most willing and useful man.

The temperature this day was—6 a.m., 74°; 10 a.m., 84°; 4 p.m., 81°; 6 p.m., 79°. Weather fine.

This country round Kiongwe is open and flat, fan-palm clumps being very numerous. The village is divided from the creek by flat ground and a thick fringe of mangroves growing in oozy mud.

The next morning, May 19, I had my people ferried across the creek to Kilimandaro. The creek is here fully half-a-mile wide, and very deep, the sea swell being distinctly felt; it took me half-an-hour to cross, and we landed on the other side on a more open shore. Kilimandaro is not visible from the water, being situated about a quarter of a mile inland at the foot of a low hill. The population were all Watiku or Bajoni, between whom and the Wa-Siyu the creek appeared to be the boundary; the Siyu people had a village at Dodori long ago, but it is now all in ruins. South of Kilimandaro and likewise on the creek are two more villages, M'Peia and Tondo, inhabited by Bajoni. I merely passed through Kilimandaro village, the Waze greeting me as I passed, and went on to Dodori, reported to be an hour's distance away; a low, hilly ridge, which I ascertained to be a continuation of the Mundane range, bearing somewhat to the right of the line of march.

The way led at first over undulating low ridges, chiefly grass, where I especially noted the richness of the soil—a rich black loam: in the intervening valleys the rain-water was lying in pools along the path. As we gradually neared the creek, mangroves again appeared. All these mangrove swamps and flat creeks struck me as being well adapted for coco-nut cultivation, and I trust will, at no distant date, be so utilized; but the natives are quite ignorant of the fact that coco-nuts thrive well in sea-water swamps. Continuing along the man-

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grove creek, which had sandy inlets here and there, I eventually came to higher ground, covered with thick bush and grass, and after crossing over the low ridge I reached Dodori village, situated on a small knoll, surrounded by a branch of the creek, 50 to 60 yards wide, through which I had to wade.

My arrival created some consternation: the people did not know what to make of my large caravan, with askaris, etc. Presently, however, after I had camped, the elders came to me and said that a letter had come about five days ago from Mze Saif, mentioning that a European was coming up, and telling them to show him every attention.

From these head-men I learned that the large forest was at three hours' distance from the town; they did not know how far it extended westward, but it was a great distance; as far, they said, as a ten days' march. Indiarubber was said to be plentiful and largely gathered by the people, who knew the forest more immediately adjacent to the village very well, as they lived in it for days when collecting rubber. This is of the *white* variety only, and the salt-water process was the sole one in use. The only inhabitants of the forest, they told me, are the Wa-Boni, who come down to buy food, as they do not cultivate. Game of all descriptions, especially elephants, was reported as very numerous, hunters coming here from Lamu to shoot them.

Aloes are said to exist in the forest, as well as "n'konge." A leaf of the former, growing near the town, was brought to show me—of the same variety of aloe that I have mentioned and described before.

In the afternoon I started with the object of visiting the creek, and, if possible, a river, reported to be beyond, flowing into it. After leaving the town and crossing a low ridge, I came upon the creek, which here opened out widely, but was interrupted by too many mangroves for navigation, Dodori being the furthest point to which dhows can come up. It was surrounded by low, thick bush, and the shores showed numerous traces of hippo: I heard several snorting a short distance away. The river was said to flow in some little distance above, but it was too dark to proceed further that day. On my way back to camp I overtook an indiarubber gatherer

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returning with about 25 lbs. of freshly-collected rubber made up into the usual balls.

A nasty gadfly, with longitudinal stripes on its grey body and a long sharp proboscis, is very prevalent about here.

I set off early the next morning for a further exploration of the country to the N.W. of Dodori. Having got to the end of the creek, which extends fully three miles beyond the town, I found myself in an open grassy, swampy country bounded on my right by a low ridge, from the top of which I obtained my first view of the reported river winding in the open and flat grass country beyond, with no conspicuous landmark as far as the eye could reach. It is a fine pastoral country, and doubtless swarming with game, though the ground at present was so saturated with moisture that the animals had probably retreated to higher and drier spots. The soil was a dark, rich, grey loam.

From another point of the ridge I obtained a second view of the river, the vicinity of which was a regular swamp; one large pool I especially noted. The river was not wide, but was said to flow some distance through the interior, in the direction of which nothing was to be seen but the same flat grass plain and scattered clumps of bush. From this point I struck off to the eastward, at first through the same open grass country, everywhere so saturated that the water lay in the lower spots or depressions to a foot in depth. There was a universal growth of rich grass, but as I proceeded the growth of the bush became thicker, and most luxuriant; there were also fair numbers of large trees with a small leaf, greatly resembling tamarinds. I continued through this country keeping to the north-east, and gradually describing a semi-circle round Dodori. I had also intended striking into the reported forest, but my visit to the river did not leave me sufficient time this day; accordingly, I returned towards Dodori, passing through numberless low swamps which were now completely flooded. The country on my way back presented the same luxuriant appearance as before; it was park-like, large trees being interspersed with bush, which, with the rich green grass and numerous water-pools, made up a really beautiful and striking landscape.

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Just before coming to a small stream, which meandered through the flat country, a large wild cycad was pointed out to me with an enormous pineapple-shaped fruit, which the Wa-Boni are said to eat. I presently struck the path used by the indiarubber gatherers in going up country, and returned to Dodori, having been absent four hours. I was much impressed with the great possibilities of the country for rice cultivation on an extensive scale, and probably in the higher portions for ground-nuts as well; whilst the upper portions of the creek promised exceedingly well for the successful cultivation of coco-nuts. My guide was an elephant-hunter, and in the course of the day we had several times passed recent tracks of these animals.

On inquiring my best way to Itembe, where I was to meet Mr. Rogers, I found that the only way from here was through Vaas, another Bajoni village on the coast, so I arranged to start for this place next day. The temperature during the day was—6 a.m., 73°; 1 p.m., 80½°; 2 p.m., 81°; 4 p.m., 80°; 6 p.m., 76°. There were heavy showers of rain throughout the day.

Next day (May 21) I started at 6.30 a.m. in a S.E. direction, over a low-lying swampy plain with a grey loamy soil, through thick bush and Hyphæne palms, passing through a fine patch of rice on the way. It was a dark stormy morning, with sharp scuds of rain, and in passing through some thick bush, we suddenly heard a leopard growling quite close to the path, but the covert was much too thick to go after him. About a couple of miles from Dodori I came upon the Mundane range, running in a west to east direction. This I crossed at an elevation of 250 to 300 feet, finding extensive metamah cultivation on the ridge as well as down the opposite slope; the soil was a sandy white with a reddish subsoil, the poorer top soil being, no doubt, caused by wash. From here I had a good view of Kiongwe and the Kilimandaro hills, and of the country between me and the creek—all low bush and swamps.

On the opposite, or S.E. side of the hills, extended a low plain with extensive metamah cultivation. The shambas were more or less extensive blocks cut out of the thick low

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bush, and on their outskirts elephant tracks were numerous. Leaving these, the path entered the dense low bush which covered the whole of the plain. This part would prove an excellent coco-nut and ground-nut country, judging from the grey loamy soil, the rich nature of which is proved by the bush growth. The path, terribly winding, was greatly overgrown, and this made progress very difficult and trying for the porters; in many places we had to crawl on our hands

MY PORTERS—A HALT ON THE WAY.

and knees and push the loads before us, and frequent halts were necessary to allow the stragglers to come up. At 10.15 a.m. we emerged from this thick bush, which it had taken us over an hour and a half to get through, into a more open country with Hyphæne and fan-palm clumps, the lay of the land being very flat and low, and well suited for rice cultivation, swampy hollows being frequent. After another mile or so, the sight of mangroves ahead showed me that I had reached the sea, and at 11 a.m. I crossed a flat sandy back-

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water, and continued over a poor and flat country, having on the seaward side a thick fringe of mangroves and sea-creeks, the Mundane range on my left being again visible in the distance.

I reached Vaas at 2 p.m., after a fourteen-mile march. I found it was quite a new town or large village, having only been built the previous year, and many of the houses were still unfinished. There is communication by sea with Faza, and the inhabitants are all Watiku or Bajoni. I camped outside the town in some small bush, pitching my tent under a small tree. Cultivation round the village—which is on the very edge of the creek, here thickly surrounded by mangroves—is almost nil, the shambas, where rice is chiefly cultivated, being further inland. All the Waze came to visit me, and from them I learnt that there is thick forest at about three hours' distance inland from the town; but from my late experience of the country near Dodori I am inclined to believe that this term forest really means thick bush. They also said that the Wa-Boni come down to trade, bringing rubber with them, but during the rainy season they cannot cross the Dodori river, which floods the country beyond the Mundane hills. I had a somewhat disturbed night here, a big dance accompanied by the beating of several big drums going on most of the night; whether this was in honour of my arrival I am unable to say!

Itembe I found was only some six miles away, and I proceeded there the next day, the intervening country round about being knee-deep in water—an open plain with a distant background of low bush, the path skirting the sea-shore, which was flat and low, and fringed with a continuous thick belt of mangroves.

Itembe itself was now simply a quagmire, all the country round about being under water, and I found my old camping-ground a regular swamp, so I had to go elsewhere. All the people were complaining of the excessive rain, their crops being all under water; it was still pouring, and camping out was not exactly pleasant, the wind and rain driving in everywhere. Some of my people found refuge in the village houses, the others built themselves little huts of grass and

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branches. Heavy squalls of wind and rain continued more or less during the night, and to save my tent from collapse, I had to jump up more than once to drive in the tent-pegs, which the force of the wind had dragged out of the ground. On waking up the next morning, May 23, I found the camp a complete swamp, and a depth of 3 or 4 inches of water inside my tent!

CAMP AT ITEMBE.

Mr. Rogers and the Liwali of Lamu, though expected the day before, had not yet arrived, so after waiting three days and constantly shifting my tent from one quagmire to another, I at last, on the 26th, for the sake of my men's health, moved my quarters to Mattaroni.

The following thermometer readings from May 23 to 26 inclusive will show the marked fall of the temperature along this coast during the wet season—

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| | May 23 | May 24 | May 25 | May 26 |
|---|---|---|---|---|
| 6 a.m. | 75° | 74° | 73° | 72° |
| 10 a.m. | 85° | 81° | 78° | 80° |
| 4 p.m. | 79° | 80° | 78° | 72° |
| 6 p.m. | 79° | 85° | 76° | 72° |

Soon after my arival at Mattaroni, a Watiku messenger came in from Itembe to report the arrival of Mr. Rogers and the Liwali in the steam launch. The heavy rain prevented my going back at once, but I sent word that I would return early next day. I started back for Itembe the first thing in the morning, wading through the low-lying plain, now one sheet of water, from 2 to 4 feet deep in places. I found Rogers, who had been unavoidably detained, and the Liwali of Lamu established in Mze Saif's house, Mze Saif having also come with them; they had picked him up at Faza on their way here. I was very pleased to see Rogers again, and after breakfast we held an important conference with Mze Saif as to my proposed journey.

I told Mze Saif that I was desirous of proceeding to Port Durnford, and from thence striking inland with a view to finding this reported large forest in the interior. He replied that "he and all he had" were at my disposal, and offered me as guide the same Bajoni elephant-hunter, Bwana Siri, whom I had had before. This man, on being sent for, declared his willingness to take me up to Port Durnford and thence inland to the forest as far as I wished to go, but he added that he feared that a tribe of Wa-Galla living in this forest might cause trouble. I told him my object was a peaceful one, and promised that I should always do my best to avoid trouble with any native tribes we might come across.

As a further security for the good-will of the Watiku, whom we might meet further north, and that they might know that I was travelling as Mze Saif's guest, and with his support, that chief agreed to send his brother with me as far as Shakan —beyond which he would not go, as there were no villages further on. Porters were to be supplied to me, where required to carry our food supplies, etc., and Mze Saif said his brother would start that very day for Rubu by sea to make the

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necessary arrangements. All this seemed most satisfactory. My further supplies of rice and dried shark's flesh for my porters had all arrived, and I had also received five more rifles, bringing up my number of guns to twenty-four.

Everything being thus settled, I bade farewell to the Liwali of Lamu and Mze Saif, and after a hearty shake of the hand with Rogers, I waded back again to Mattaroni, to start next morning for the unknown country to the north.

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## CHAPTER XXIII

### JOURNEY TO PORT DURNFORD, *continued*—START FOR THE INTERIOR

To Parts Unknown—Bajoni Villages—Rubu—Mohamed bin Saif—Cotton Cultivation—Homwé—A Unique Event—Difficult Marching—Kionga—An Object of Curiosity—Shakan—An Unexpected Delay—Ras Kiambone Wells—Ancient Ruins—Gomé la Hekwa—A Rocky Coast—The Cape of the Pillar—An Alarming Report—Shakalasia—The Dhow Ashore—Port Durnford—Shauris with the Natives—I march Inland.

I STARTED from Mattaroni at 7 a.m. on May 28, 1893, the path at first skirting the open sea-shore over low white sandy ridges covered with thick clumps of fan palm. This continued for the distance of a mile to the small village of Shwé, situated close to the sea, mangroves being again met with here. There was no cultivation around this village; the shambas were some distance inland, where the people cultivated metamah and cotton, the latter being of the same description as that grown at Mattaroni. After obtaining a fresh guide as arranged with Mze Saif, we continued our way, skirting the mangrove-fringed edges of a deep and narrow sea-creek running parallel to the coast to the north-east of the village, the land side terminating in a steep ridge 8 to 9 feet high covered with thick bush, the soil being a light friable chocolate or reddish loam. I shortly afterwards reached a second Watiku village called Vundene, about three-quarters of a mile from Shwé, which it much resembled, also having its shambas inland. The path presently left the sea-shore, crossing a white sandy flat covered with thick fan palms, into thick bush with a reddish-yellow friable soil, on emerging



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from which I came upon a third village, called Simambaya Sendeni, about three miles beyond Vundene.

This was the largest village I had yet come to, and possessed a stone mosque. The village is situated on rising ground close to the sea, with a harbour or landing-place for dhows. The walls of the houses were plastered with bright red earth, and the village had a prosperous look. The people owned neither cattle nor donkeys, owing to the prevalence of the Ganda fly; they had, however, flocks of goats, which

SHWE.

they purchased from the Somalis. There were some fine tamarind trees and a few lanky tapering coco-nuts in the village, which the people informed me were not tapped for "tembu," as their appearance at first led me to suppose; the chief products cultivated here are millet and cotton.

Leaving this village, which the people told me I was the first white man to pass through, I arrived about a mile further on at the village of M'Swakini, divided from Sendeni by dense thick bush, amongst which I noticed many umbrella-

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shaped mimosas. The ground was of a deep red colour, an evidence of iron in the soil, and in places there was a good deal of coral outcrop. In the small cultivated area round the village I observed a tobacco patch and some castor-oil plants.

Hence onwards the way led uninterruptedly over an undulating country covered with dense bush, chiefly umbrella-shaped mimosa, growing so thickly together as to form a green arch overhead, the soil a rich deep chocolate loam.

RUBU.

This continued till I reached the large village of Rubu. As the crow flies it is about six miles from Mattaroni, but owing to the windings of the path and the slow progress made by my caravan, it had taken me three and a half hours to reach.

Mohamed bin Saif, the brother of Mze Saif, who had arrived here with my further supplies of rice and shark's flesh the evening before, came out to meet me accompanied by the elders of the town, and escorted me to a large baobab tree under which I camped. I had a second visit from Mohamed bin Saif in the afternoon, and paid him for the loads brought



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up from Itembe. I thought it a bad sign that one of these should already be missing. I said nothing, and accepted his explanation that one of the Itembe people must have stolen it, and entertained him to the best of my ability with tea, biscuits, jam, and cigarettes. He left in the evening by dhow for Kionga, sleeping that night on Simambaya Island, and taking the loads on with him. He expressed his desire before

MOHAMED BIN SAIF.

leaving that I should pass by his village of Homwé, and this I promised to do on the morrow.

Rubu, the largest village I had come to yet, is built on the sea, the island of Simambaya lying opposite and forming a natural harbour, thick mangroves fringing its muddy shore. The people I found most friendly and very communicative. Their water supply is poor and scanty, and they have to send to Vundene for it in the dry season.

The Ganda fly is prevalent here also, consequently the people possess no cattle, but there appeared to be numbers

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of sheep and goats. Wa-Galla and Wa-Boni come down to trade, but the chief intercourse with the interior is at Kionga. An extensive cotton cultivation is reported to exist here, much larger than at Mattaroni, the lint-cotton and cotton-seed (used for feeding cattle) being shipped to Lamu.

Cotton cultivation is said to cease beyond this. Other cultivation consists of millet, sim-sim, etc., and a good deal of beans; little maize appears to be grown. The castor-oil plant grows wild, and there were a few coco-nuts growing in the village; the people told me they had planted others, but they had died, most probably from want of care. Besides coco-nuts, there were many Hyphæne palms growing about. The soil is good, being remarkably friable and porous; the people said that it dries up at once after rain. I found it generally varied from red to a chocolate-coloured loam; the mud walls of the houses are of a bright red. The vegetation everywhere is wonderfully luxuriant.

Bwani Siri, the head guide, came to me in the evening to ask my permission to take on his brother, who lives here, with us. I willingly assented, and gave him some money to leave with his family during his absence. Ever since leaving Kiongwe I had been drilling my people daily on the chance of trouble ahead.

The temperature this day was at—

| | | | |
|---|---|---|---|
| 6 a.m. | ... | 76° | Showery. |
| 11 a.m. | ... | 82° | Fine. |
| 2 p.m. | ... | 78° | Showery. |
| 4 p.m. | ... | 76° | Fine. |
| 6 p.m. | ... | 78° | Rain at night. |

Early on the morning of the 29th I resumed my march to Homwé as arranged—guided by Bwana Siri and his brother—at first through the usual thick bush, then over flat, grassy, low-lying land, and finally across a mangrove swamp, through which we waded to reach a low wooded ridge right ahead. Ascending it, I found myself on a flat plateau or table-land covered with dense bush, with a good deal of guinea-grass growing in the undergrowth, the soil here being a rich grey friable loam.

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Looking over the surrounding country from this higher elevation, the thick bush seemed to extend as far as could be seen in every direction.

As I proceeded, the ridge gradually shelved down to the plain, and I continued wading through a series of swamps—often knee-deep in water—these swamps being generally in hollows surrounded by thick dense bush. Emerging from it at last I came upon some large open shambas of ground-nuts and sim-sim, the plain here being bounded on the north-west by a low, wooded ridge about a quarter of a mile away. These fields form part of the cultivation of Homwé, and belong to Mze Saif, Homwé village being just opposite on the edge of another swamp, which, although it dries up in the hot season, yields a constant supply of water from wells sunk in its bed. In this village is the residence of Mohamed bin Saif, and it is about six miles in a straight line from Rubu.

After a short halt, the march was resumed through the thick bush, the soil being a chocolate loam. I was walking ahead of my porters, but the guides begged me not to do so, but to follow behind, so that the people in the next villages might be warned, and prepared for the unique event of the visit of a white man!

After continuing for some distance through the bush, here and there more open, we emerged upon another cleared and cultivated area, consisting chiefly of young sim-sim averaging 6 to 12 inches high, the soil again a grey friable loam and the lay of the land very flat; the low wooded ridge still continued about a quarter of a mile away on my left. From some gently undulating country further on I obtained a distant view of the sea far away on my right, whilst straight ahead lay another native village surrounded by a fairly large cultivated area, chiefly sim-sim, but with a few rice-fields also, the soil being a fine red to chocolate loam with a very friable red subsoil.

This village was called Mambore, and is about two miles distant from Homwé, fairly large and prosperous-looking, with the walls of the houses plastered with bright red earth. I here noticed two young coco-nut trees, very carefully

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fenced and protected, growing in front of one of the houses. The Waze and nearly all the village were waiting to see me when I arrived, this time at the very tail of my caravan, and I became the object of a good deal of curiosity, and, I hope, admiration!

Bidding good-bye to the Mambore people, we re-entered the everlasting bush, occasionally passing a good deal of previously cultivated land, the soil of grey loam with a friable chocolate-coloured subsoil.

The re-appearance of mangroves on my right showed that the path had again come close to the sea, or more probably a sea-creek running inland; passing these the path again led through the thick bush, the overgrown condition of the path making our progress very slow and difficult, so that I was obliged at last to set four askaris to cut and clear the path ahead for the porters. From here my progress onward was through much the same description of country, thick dense bush containing many large umbrella-shaped mimosas, the path now and again skirting a sea-creek with thick mangroves, till at 1 p.m. I at last came out on the flat white sandy, mangrove-fringed sea-shore, which I followed till at last I noticed ahead the white stone pillar of an Arab tomb. We arrived at Kionga at 1.25 p.m., having taken seven hours to accomplish the eighteen miles from Rubu.

Kionga, which may be described as a small town, is, I suppose, the most important place on this coast north of Patta Island. It is situated on an open white sandy beach sheltered by two islands, one of which, named Kiongawani (literally the island of Kionga), is situated almost in front of the town, so that it protects it from the sea, and forms a good anchorage for dhows—one being there at the time of my visit. The population are Watiku, this being the name which they bear on the mainland.

Trade is carried on with the Somalis in both cattle and goats, which are driven down overland from the north; there were from fifteen to twenty Somalis in the town at the time of my arrival, while two of that tribe had travelled up with my caravan from Rubu.

The chief cultivation carried on here, besides a little maize,

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appears to be raggy. There are also some healthy coco-nut trees growing inside the town. I was told, on the authority of Mohamed bin Saif, who had arrived with my loads of rice that morning, that this was the first fine day they had had for forty days ; there is said to be a heavier rain-fall here than at Lamu, but the ground is much drier and absorbs the moisture more quickly.

KIONGA BAY.

The extreme curiosity of the people was a great nuisance. I camped a little outside the town on purpose to avoid them, but even here I was followed by a large crowd, watching with interest the various preparations for forming my camp, and some Somalis were highly offended because the askari on guard would not permit them to enter my tent while I was having my breakfast. Kionga was infested by a plague of innumerable flies, attracted by the decomposition of heaps

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of cowrie shells, which are gathered here from the sea in large numbers and form an article of export. The flies swarmed everywhere and settled on everything you touched or ate. The whole place was black with them, and they crawled all over one's face and hands and were an awful nuisance.

In the afternoon Mohamed bin Saif, accompanied by the Waze and leading people of the town, about thirty in number, came to pay their respects, and brought a sheep as an offering. I gave them some very sweet tea, which they drank in turn out of my two iron cups, as well as sweet biscuits and cigarettes, and I also presented Mohamed bin Saif with a suit of thick tweed clothes. When these people had departed I had a long talk with Mohamed bin Saif, at which Bwana Siri the guide was present. I discovered that I should have to depend mainly upon myself for the future, being now told that I could not get any porters here to carry my surplus loads, and it was suggested that I should send them by sea in a dhow. Mohamed bin Saif in telling me this apparently considered that he had done all that could possibly be expected of him. I strongly protested, repeating for his benefit all that his brother had promised to do for me at Itembe. However, porters I could not get, so it was eventually arranged, after considerable arguing and trouble on my part, that a small dhow, which could only carry about thirty loads at a time, should bring up our surplus food stores from here to Port Durnford by instalments, I agreeing to pay the *naossa*, or captain, sixteen rupees for each trip. I resolved to remain here another day to re-arrange the loads, and leave what was not immediately wanted, with one of my askaris in charge, to be brought up later by the dhow.

I endeavoured in the course of the day to buy some tobacco for my porters, but could only obtain a small quantity, which was very dear. Tobacco, I was informed, was grown at Itembe, and they also imported it from Patta Island.

The following day, May 30, I spent in getting my loads into order, and re-packing those that were to be left behind for the dhow's next journey: there were thirty-four loads of rice and some other stores. In strolling through the town in the

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afternoon Mohamed bin Saif pointed out a white pillar on Kiongawani Island, which marked the place where an English officer was buried, and which had been erected by the orders of Seyd Bargash, Sultan of Zanzibar.

It appears that two officers, accompanied by an interpreter, had landed here from a man-of-war; one of them, whose name is said to have been "Simba" (Lyon or Seymour?), had been killed by the spear-thrust of a Bajoni. The man-of-war had

KIONGA.

afterwards returned and landed a party of blue-jackets, who had burnt the town and cut down all the coco-nut trees. The Sultan had ordered Mohamed bin Saif to bring the murderer down to Zanzibar, where he was eventually tried, and I believe executed.

In the evening I had a parade of all my askaris and armed porters, serving out twenty rounds apiece to the porters and forty to the askaris, and making them responsible for every cartridge received.

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I annex thermometer readings for this day—

| | | | |
|---|---|---|---|
| 6 a.m. | ... | 73° | Fine. |
| 2 p.m. | ... | 80° | |
| 4 p.m. | ... | 78° | |
| 6 p.m. | ... | 78° | |

I resumed my march to Port Durnford next day at 7 a.m. in pouring rain, Mohamed bin Saif, the Waze, and a large crowd of people coming to see me off. I dispensed with Mohamed's stipulated attendance to Shakan, as I found it was only about an hour's distance away. We went along the sea-shore, which may be described as flat and low, with occasional coral rocks at times forming headlands. I observed many people gathering cowrie shells a long way out in the shallow water, the breakers being a quarter of a mile or more away. Reaching Shakan, which was the home of my guide Bwana Siri, I halted my porters on the beach whilst I went to his house to meet the village elders, to whom I showed Mze Saif's letter. They took it away to read, returning shortly afterwards with a sheep, which they begged me to accept, as I was the first white man to enter their village; I gave them a money present in return.

Shakan much resembled the Watiku villages already passed, and contained about two hundred inhabitants. The houses, as at Kionga, were thatched with *makuti* (coco-nut leaf), which is imported from Faza. The people were very anxious to call my attention to their want of good wells, and begged me to report the matter to the authorities, as their water supply was very limited, and gave out entirely in the dry season. They are then obliged to send to the wells at Ras Kiambone for water, which they bring back in canoes. There were some old wells in the village, built or dug a long time ago, but the water was brackish and undrinkable.

More cowries are said to be obtained here than even at Kionga, and this fact most probably accounts for the position of the village. Small canoes can ply in all weathers in the still water, or lagoon, which is formed behind the breakers by the numerous coral islets characteristic of this coast. Cotton was said to be cultivated here, thus contradicting what had

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been told me at Rubu, viz. that this product was not grown north of Kionga.

Having halted at Shakan for about an hour, I resumed my march along the sea-shore, which was bounded by white sandy cliffs about 20 feet high; scattered coral islets forming a line of breakers about a quarter of a mile out at sea. We passed quantities of sea-weed, which accumulates inside the breakers and is heaped up in large masses on the shore.

On coming to a low point or cape running out into the sea, with about five islets extending beyond it, the guides, who were ahead, stopped the porters; on asking the reason why, I was informed that we should have to wait until the dhow which had sailed from Kionga at daylight arrived here. As the vessel would have to wait for high tide to pass between the headland and the nearest island, and even then there would be barely enough water to float her, the loads would have to be taken out and carried across by land. Mohamed bin Saif might have warned me of this, but he let me go off without a word.

I sent Bwana Siri's brother back at once to Shakan with some money to get fifteen or twenty people from the Waze there, and with orders to stop with the askari on board to see the dhow re-loaded, and then to come on with her afterwards.

I resumed my march, crossing the low headland which is situated some ten miles on this side of Kionga, and called locally Ras Kiambone—the "Dick's Head" of the Admiralty charts—and found myself on the border of an extensive grass plain bounded in the distance with thick bush; the soil grey loam, with large coral rocks scattered here and there, often 10 feet high. I halted at a water-hole about half-way across, where we met a party of five elephant-hunters returning from an unsuccessful expedition; they said the country was too flooded to do anything—pleasant news for me!

This water-hole, or spring, as it should be more correctly described, is said never to fail, and is the place from whence the Shakan people obtain their dry season's water supply. It is a noted halting-place for elephant-hunters and others travelling along this coast.

Leaving the headland, and proceeding for about three-

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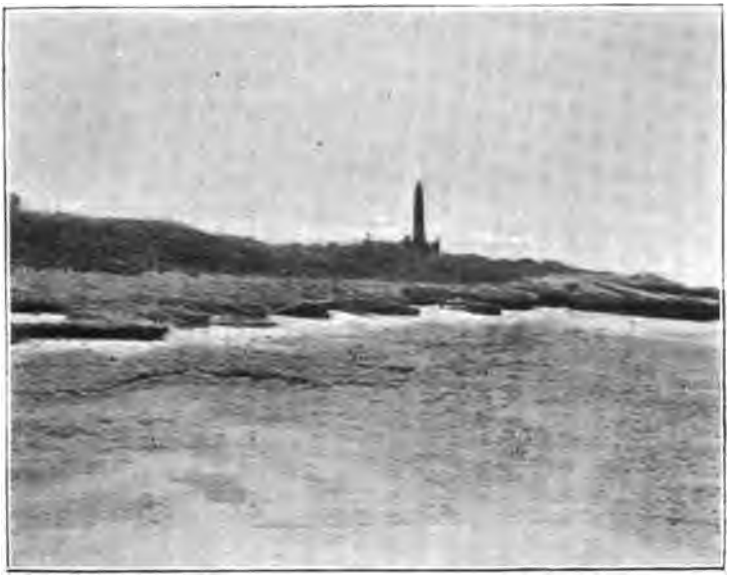
quarters of a mile along a very rocky coral sea-shore, I came upon a high stone pillar and a ruined mosque and tombs, then a little further on I found more ruins, and about a mile beyond still more. These last included an old stone archway, evidently the remains of one of those old towns which were destroyed by the Galla invasion, but of which these scattered ruins remain to bear witness to the large population—settlers from Arabia, Persia, and India—that once inhabited this coast. Their architecture, appearance, and the frequent



HIGH STONE PILLAR NORTH OF RAS KIAMBONE.

adornment of the mosques, and often of the tombs, with the fine celader china, and even in some cases with Persian encaustic tiles, bearing on their face the name of the founder and the date when the mosque was built, often as far back as 650 years ago, prove not only their great antiquity, but the comparatively high state of civilization that must have existed amongst this now forgotten race.

From the glimpse I obtained here and there over the low white sandy ridges which terminate the coast-line, the interior

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appeared to consist of low undulating ridges with intervening hollows clothed with thick bush, while further away there appeared to be forest. Continuing steadily along the beach, I observed a high headland in front, and the guides striking inland towards it to avoid a bay lying between, we travelled over some steep ridges, and reached the foot of the peak at 3 p.m. This rocky headland, named by the Watiku, Gomé la Hekwa—the same probably as the "Sherwood Point" of the Admiralty charts—forms a very conspicuous object, standing out as it does abruptly from the surrounding flat coast; it is situated about twenty miles from Kionga.

The guides wished me to halt on the beach to the leeward of the rock, but I decided to camp on the landward side nearer to the water-pool said to exist here. On inspection this proved to be only a pool formed by rain-water in a hollow of the ground. I climbed up to the top of the rock, and obtained a good view of the country inland, which appeared to be flat and covered with thick bush. I afterwards had a dip in the sea, which I enjoyed very much after my tiring march, for we had been travelling steadily, with but brief intervals of rest and no food or water, since we left Kionga. My porters thoroughly enjoyed the two sheep given to me at Kionga and Shakan, which I presented to them as a change from their dried shark and rice diet. I put a night guard on from to-day, two men to be relieved every two hours. The night passed without incident, and the steady sea-breeze made it beautifully cool and pleasant.

Next morning, June 1, at 7 a.m. we continued onward along the shore—here with steep white sandy ridges from 20 to 30 feet high—coming about a mile further on to a rugged rocky peak covered with short grass and low scrub, across which we had to scramble, as the waves dashed right up to the foot of it. From this peak I got another good view of the interior—a flat country covered as far as the eye could see with dense bush. The peak continued along the coast for some distance, forming a high rocky ridge overhanging the sea, and in crossing it the guides pointed out a small cave and camping-ground of elephant-hunters with a rain-water pool close by.

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Descending we crossed another flat point of land beyond, covered with thick bush and grass, amongst which I noticed some *Sansevieria guineensis* growing in a good red chocolate loam; nearer the sea the soil changes to grey sand, the white sandy ridge facing the sea still continuing, but much lower.

For the next hour I travelled along the shore past much coral rock and deep sandy bays, which the tide being out enabled us to cross, passing another rain-water pool called

MY CARAVAN ON THE MARCH TO PORT DURNFORD.

Kombara Bala. The careful way in which the locality and position of these various pools is marked and recognized, shows how scarce the water supply of this portion of the coast must be, yet the numerous towns once existing here is proof that at one time the supply must have been plentiful enough, and that it doubtless would be again if required.

At 10 a.m. we had to strike inland again to avoid a low rocky headland running out to sea called Ras M'Narani, or the Cape of the Pillar, so called from the large broken pillar

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or column lying on a low knoll behind it. I went to have a look at the pillar, and found it to be well built of coral stone with a thick outer plastering of lime. Between this and the next cape the porters discovered a turtle's nest, and dug out over 100 eggs. The cape is called Ras Garavole, and we had to strike inland and climb over a low ridge covered with thick bush to avoid it.

Beyond this the coast-land may be described as flat and low, white sandy ridges alternating with wide sweeping bays and low headlands. Halting at 12.30 p.m., I received startling news which seriously threatened the progress of my expedition. We met a Watiku fisherman from Port Durnford, who told my head guide, Bwana Siri, that some of the Somalis we had seen at Kionga had gone up ahead of us, and calling the Gallas together, had given them five sheep as an inducement to make common cause against me, they asserting that I was coming up with many guns to make war. The Gallas were urged to join the Somalis in attacking me, and some of the latter were to go at once and warn their people.

I held a council of war over this information, and decided that Bwana Siri and his brother—the latter had joined me again the night before, and we had sighted the dhow with our supplies off and on the whole day—should go on at once to Port Durnford, or Burkau as it is called by the natives, taking Mze Saif's letter with them to the Waze, and to inform them and the Gallas of the true object of my journey. I would halt for the night at a water-pool, an hour or more away, where the guides were to rejoin us the same night if the news was true, but if not, they would only come out to meet me next day. I impressed upon them that, whether the news was true or false, I was not going to be stopped, but would march on in any case.

The guides having started, I resumed my march, and after an hour reached the water-hole called Shakalasia, on the other side of another low point; here I camped below a low ridge, having marched fourteen miles from my last camp at Gomé la Hekwa. The water-hole was choked up with earth and rubbish, and when cleared we found the water excessively

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salt and brackish, at which the porters grumbled a good deal. However, the dhow from Kionga was anchored beside the point, so I was able to get a little water from her, but it was very little, and in the end I had to fall back upon the awful stuff in the hole, which tasted worse than any sea-water. I held a muster of all my people, askaris and porters, and told them that we were now in an enemy's country, and that they would have to strictly obey and carry out the regulations

CAMP AT SHAKALASIA.

which I proposed to enforce for the sake of our mutual safety, whereupon they gave a cheer and promised to obey.

The temperature this day was as follows—6 a.m., 72°; 3 p.m., 83°; 6 p.m., 78°.

It rained heavily most of the night, and I had to move my tent to the shelter of some bushes on account of the strong south-west wind blowing in from the sea. There was no word of the guides next morning, so I started off again. The weather was still very wet and stormy. Our way was still

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along the sea-shore, here fringed with rocky islets (the Rozier Rocks), one larger island lying in front of Shakalasia Point, whilst inland the country consisted of low ridges, beyond which it was open and flat and covered with grass and bush.

An hour after our departure, on turning a rocky corner, I was dismayed to see our dhow had run aground; I called a halt, and put everybody on to lighten her, and it was not till the last load was out that she floated again. We then had to re-load, but all the porters worked with a will, for she carried all our future supplies, and when the last load was on board again they pushed her off into deep water with a cheer.

The coast-line varied between white sandy bays—remarkable for the large accumulation of sea-weed on the beach, often 4 to 5 feet deep, and beaten into a compact mass by the action of waves—and low rocky headlands; we often had to wade up to our middles to get round them, slipping over the jagged coral bottom, and often falling into unexpected holes. About ten o'clock I saw my guides coming to meet me accompanied by some of the Port Durnford people. The news of yesterday was apparently a false alarm, and so far this was satisfactory, but I afterwards had reason to suspect that the report had been got up by the guides themselves, either to obtain an opportunity of getting to Port Durnford before me or for the purpose of frightening me.

The Port Durnford people expressed much pleasure at seeing me, and escorted by them I continued my march over the rocky coral strand, which was very trying for the porters' bare feet. After rounding some more rocky points and coming upon open sandy beach again, the guides pointed out a group of casuarina trees some distance ahead, saying they were close to Burkau or Port Durnford. Shortly afterwards, to my relief, the guides struck inland across gently undulating grassy downs with scattered clumps of bush, everything appearing to us very green and luxuriant after so much marching over sand and rock. As we proceeded I obtained occasional glimpses of the Port Durnford estuary, a fine wide bay apparently running for some distance inland. At last, at 11 a.m., we reached the village of Burkau a little beyond the clump of casuarina trees.

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Burkau I found to be an ordinary Watiku village exactly resembling those already seen. It is situated on the shores of the estuary, and contains about one hundred and fifty people. They own a few head of cattle, which they purchase from the Somalis, and also have a good many goats and sheep. The Waze came out to meet me and escorted me to the Baraza, where I handed them Mze Saif's letter and explained the object of my journey, the head-man promising to come and see me later on. Not finding a suitable place in the village,

FIRST VIEW OF PORT DURNFORD ESTUARY.

which appeared poor and dirty, I fixed my camp near a water-hole a little distance off.

The dhow with our supplies arrived early in the afternoon, and I arranged with the captain for him to return at once to Kionga to bring up the remainder, as well as some further supplies, which were to have been sent up by Mr. Rogers. I promised him an extra present if he returned quickly. I re-packed all the loads brought up, leaving fourteen and a half bags of rice and fish to be sent on by the porters I hoped to



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obtain here. I was still busy over this when the head-man arrived, bringing with him a sheep as a present. I asked him for porters to carry these extra loads ; I only wanted them for one day or two, as I proposed making a camp about two days' march ahead, and then sending my own men to and fro to get up the food as it was required. My head guide having suggested the advisability of obtaining a local man, I also asked for a guide.

CAMP AT BURKAU.

The head-man in reply said it was impossible to supply me with porters, as all the slaves were now away working in the shambas, which were a long way off, and that they had no food to sell. He would give me a guide if I wished it, but no one knew anything of the country inland except that it was all thorns, quite impossible to cut through, and besides, that the country was now entirely under water ; that he had never heard of any forest, but that of course he was ready to help me in

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every way, according to the orders he had received from Mze Saif.

To this very unsatisfactory declaration I answered that I had come up as Mze Saif's guest, with his full knowledge and support, that I only wished to examine the country and ascertain the truth about this reported forest, whether it existed or not; if not, very well, but I would rather find out the truth for myself.

As to the thorny bush, I had brought hatchets and knives and would cut a path through if necessary; if the country was flooded, why, we should have to wade, that was all. I added that I wished to start next day, as my food supply was limited, and he had just told me I could buy nothing here. I presented him with ten rupees for himself and a similar sum for the Waze, promising a further present on my return if he gave me satisfaction. He thereupon promised to get me a guide for the next day, but added that it would be advisable for me to give a present to the Wa-Boni and Wa-Galla head-men before I started. To this I consented, and fixed the interview for next morning, after which I proposed to start for the interior.

Owing to the number of Gallas about the village, several of whom came to visit my camp, I thought it advisable to keep all my men at hand, putting a couple of sentries on guard.

The temperature this day was—6 a.m., 72° (with heavy squalls of wind and rain); 1 p.m., 83°; 4 p.m., 81°; 6 p.m., 76° (squalls and showers in the night).

The following morning, June 3, was again stormy and wet. I had my tent struck, and all the loads packed in readiness to start as soon as my shauri with the native head-men was over. They shortly afterwards arrived, sixteen Wa-Galla and some Wa-Boni, accompanied by the head-man and Waze of Burkau. I opened the discussion by reminding them that the Wa-Galla and Wa-Boni and the English were friends, and telling them that I had only come to look at their country, and take back information about themselves. I had come for *amani* (peace), and not for war.

The leading Wa-Galla replied—Yes, that from the Sabaki to the Tana the Wa-Galla knew that the English were friends,

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for never had there been any fighting or trouble between them; the English had lately fought against the Somalis at Kismayu, but they were also the enemies of the Wa-Galla, and I was very welcome to enter their country as far as they were concerned.

I thereupon gave thirty-two rupees to be divided amongst the Wa-Galla and ten rupees to the Wa-Boni, and the promised local guide having arrived, I bade them all farewell and

PORT DURNFORD.

made an immediate start, the head-man escorting me a part of the way.

The country traversed during this first day's march from Burkau was mostly low bush—latterly very thick, and involving much cutting, umbrella-shaped mimosa being very numerous. The general lay of the land was flat, crossed at intervals by several low ridges, one called Shimawongo being about a couple of miles to the north-west of Burkau. The intervening valleys were at present complete swamps, owing to the heavy rains, and through them we had to wade often above knee-

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deep. Two miles further on we came to another low ridge named Kinawi, which we skirted, marching through a low valley all thick bush, and also completely flooded to a depth of 2½ feet; progress was slow, as we had to feel our way through the water to avoid the numerous holes made by elephants, many of which seemed to have been here quite recently. Beyond this the land gradually rose, and we continued cutting our way slowly through the thick bush till, at

INTO THE BUSH.

3 p.m., we came upon another swamp, with the fresh tracks of numerous hyænas and wild dogs at its edge. The guides said they must have been attracted by a dead elephant, and they begged me to camp here, saying that the hyænas would be sure to return at nightfall, when they would follow them and find out where the elephant was and get the tusks—a great find for them. I agreed, but told them as to-day's had been a very short march they must make up for it by a longer one to-morrow.

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We had to clear a space for our camp in the thick bush, which really only wanted large trees to be called a regular forest. Our progress had been so slow that I did not think we had covered a greater distance than six miles in the five hours since we had left Burkau. The country undoubtedly looked most fertile and promising, the soil for the first part of the journey being of a brown to reddish chocolate, and latterly of a good grey loam.

Much to the disappointment of the guides the hyænas never returned, and but for the trumpeting of a distant elephant, our first night in the bush passed quite quietly and without incident of any kind.

The temperature this day was—6 a.m., 72° (rainy); 4 p.m., 79°; 6 p.m., 75°.

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## CHAPTER XXIV

### SEARCH FOR THE FOREST

Into the Bush — Cutting our Way — Orchella-weed — Warkono — An Elephant Haunt—Buramanza Hill—Makundu Ridge—A Useless Guide—An ever-receding Forest—Fever—A Shauri with the Guides—Stalking a Leopard—Burkau again—Deceit of Head-man—Resolve to fall back—The Wa-Galla Settlements on the Wiori River—A Declining Race—Good-bye to Port Durnford—Shamku—Thirst—A Weary Night March—Return to Kionga—Engage another Guide—My New Plans.

THE country through which I travelled on my second day's march still continued very flat and swampy, water lying everywhere, often a foot deep.

Tracks of elephants were very numerous, the ground in places being ploughed up into a regular quagmire by their ponderous feet. The bush was so thick and dense that it necessitated constant cutting to get through it. It was literally a case of marching five minutes and then waiting five minutes for a path to be cleared, four askaris, changed every hour, being set to cut a way ahead; our progress was therefore slow in the extreme. Mimosas were frequent, and some of the bush was large enough to deserve the name of low forest, the trees averaging from 15 to 20 feet in height. Orchella-weed was reported to be plentiful, and I passed some dead and deciduous trees covered with it; it became still more plentiful further on. About two hours after I had started we came upon a cleared space on higher ground, called Warkono, where elephant-hunters and orchella-weed gatherers are accustomed to camp. From this point onwards our way continued through the same description of country—thick bush inter-



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mixed with larger trees, and here and there an occasional baobab rising above all. The land was flat and low, and we were constantly either passing water-pools or wading through them, the soil being an excellent rich grey loam. Elephant tracks abounded, and, judging from the freshly-dropped dung, quite recent, so that I fully expected to come upon one of them at any moment.

Towards noon we got upon a higher level, and in another

BURAMANZA HILL.

hour we reached the foot of a hill called Buramanza, for which the guides had been on the look-out for some time; it is a noted and conspicuous landmark for elephant-hunters, remarkable for its solitary position amidst the surrounding flat plain. I found it very steep to climb, with frequent coral out-crops, much weather-worn. Its summit, which I estimated to be from 250 to 300 feet high, was a fairly large plateau with a dense undergrowth of bush, among which larger trees, such as baobabs and mimosas, were growing in a rich chocolate

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loam. I was much struck with the appearance of some curious flat stones pierced with circular holes, so regular in appearance as to suggest the hand of man, but the head guide who was with me said—"It is God's work, no one has ever been up here before!"

From the hill-top a very extensive view was obtained of the surrounding country, which, as far as the eye could see, presented one uniform appearance of thick bush, with here and there larger trees standing out prominently. Large green swamps or flooded tracts were also a noticeable feature of the landscape; one very large one about two miles to the south-west my guide said was called Bomzo.

The bush appeared denser further inland, but even with my field-glasses I could see nothing on the horizon but this uniform green area of low forest, and with the exception of a small ridge some distance away, the general flatness of the landscape was unrelieved by any noticeable elevation of the ground, the only variety being the large green swamps and distant gleams of flooded water. It was three o'clock in the afternoon before I rejoined my porters; I found them halted about a quarter of a mile off, and the place being a suitable one, I decided to camp there, for we all had had a rough time of it since we started at seven o'clock in the morning.

I heard distant gun-shots several times during the day: the guides said that they had been fired by elephant-hunters.

On overhauling my loads I found I had still five days' food for my people, so I resolved to persevere in my search for the forest for three days longer, and then return by forced marches to the coast by the path which we had cut through the bush.

It rained again heavily during the night, but my people were well sheltered under huts built of grass and branches, which they erect quickly at each camping-place. My head people had small tents of their own made of American drill.

The temperature of this day was—6 a.m., 72°; 4 p.m., 80 (no rain during the day); 6 p.m., 76° (rain at night).

The following morning, June 5, my third day in the bush, we started off at 7 a.m., making our way across the intervening valley towards the ridge we had sighted from Buramanza Hill the day before. Our progress was again exceedingly

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slow, every step of the way having to be hacked through the dense bush; this continued, with constant halts to allow the men ahead time to cut the bush, till three in the afternoon, when we were nearly abreast of the ridge we had been making for so long; the guides called it Makundu. The country passed through presented much the same characteristics as previously described; we passed numerous clumps of *Sansevieria*.

On reaching Makundu ridge, I told Bwana Siri that as the

OUR PATH THROUGH THE BUSH.

people had had a very hard day's work I proposed camping on the other side of it, but he said to get there we must make a wide circuit, as the bush immediately round the ridge was very thick and quite impenetrable. Off we went again, and after another hour's hard cutting the guide suddenly declared that as there was no water there we must again alter our direction. I agreed, but asked him why on earth he had not told me this before!

Now began an aimless wandering here and there, our head

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guide showing, purposely I believed, an utter ignorance of the country, for it seemed to me that we were now retracing our steps towards Burkau in a parallel direction to that we had travelled over yesterday. As it was getting late I said nothing, intending to remonstrate afterwards, for I found the local guide brought from Burkau to be perfectly useless. He admitted that he was only a slave, and knew nothing whatever about the country, having never been here before, but said he had been ordered to come, and what could he do?

LAST DAY'S CAMP IN THE BUSH.

Just as it was getting dark we reached a water-pool, by which we camped, all dead beat after our tedious ten hours' wandering in the bush.

In the evening I had a long talk with the guide, Bwana Siri; I told him I had sent for him privately, as I did not wish to shame him before the others. I asked him what was I to think?—here we were, after three days' aimless wanderings, as far off as ever from the forest we were seeking; could he be surprised if, judging from his actions to-day, I had begun

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to believe that he did not know the country? Would it not be better to return at once to Port Durnford and get a better guide, and make a fresh start? He must see for himself that the man we had brought was an utter failure, and not worth the daily ration of food I gave him. Bwana Siri admitted the truth of what I said, but begged me not to turn back, saying—"Wait till to-morrow, I will promise to lead you to a big forest." I agreed to give him another chance, and so the conference ended.

Several elephants trumpeted close to our camp during the night, which otherwise was undisturbed. I had a sharp bout of fever, brought on by the constant wettings I had gone through during the last two days, and was only able to take two thermometer readings, viz. at 6 a.m., 76°., and at 4 p.m., 78°.

The next day was a repetition of the old weary business of hacking and toiling through this apparently never-ending thick bush, broken only by swamps, through which we paddled, often slipping into the deep holes made by wallowing elephants. After three hours' tramp the country at last became more open, small grassy glades becoming frequent, the soil alternating between the usual grey loam and a chocolate and light friable red.

Whilst resting at noon by a water-pool situated in a picturesque glade, the guides came up to me and asked to have a shauri. Bwana Siri's brother, acting as spokesman, said they had only just been told of my last night's conversation with his brother; that this sort of business was no use, for neither he nor any of the others knew anything whatever of the country; that several times during the day they had climbed trees but could not discover any signs of forest or large trees, and that he spoke in the name of all in asking me to turn back to Burkau, where we could make a fresh start with guides who did know the country.

With my limited supply of food and useless guides, this really seemed the wisest course to adopt, especially as the country seemed, if anything, to become more open. The accompanying illustration is typical of the larger trees—somewhat resembling a dwarfed oak—that grow in this portion of

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the country. I finally gave the order to turn back, and make for our previous day's camp at the foot of Buramanza Hill.

Shortly afterwards Bwana Siri, who was following behind,

TYPE OF LARGER TREE GROWING IN THE INTERIOR.

sent me word that he had heard an elephant moving quite close to the path. I called to Dumgu, my head-man, and we made our way as quietly as we could to where the guide was waiting on the edge of the bush, where, after a short and

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exciting pause, we heard a gurgling sound proceeding from a thick clump of bush about twenty yards away.

Bwana Siri then declared it was not an elephant but a lion, and we presently heard the beast, who must have been quite unaware of our proximity, leisurely yawning; we stole up as quietly as we could, but before any of us could fire a shot a fine leopard stole out of the bush and bounded away. We resumed our march, and without further incident reached our old camping-ground below Buramanza Hill.

Starting early the next morning, June 7, we travelled back very quickly over the path it had taken us so much toil to cut, arriving at Burkau at one o'clock the same afternoon. Just outside the village my attention was called to some old ruins, the remains of an old stone wall and one or two tombs, evidence that the Watiku must have been settled here a very long time ago.

I went at once to the Baraza, where, sending for the head-man, I told him that I evidently had to thank him for my five days' wanderings in the bush, and that I was exceedingly displeased at the manner in which I had been treated, but that I was now more determined than ever to ascertain the truth about this forest, and expected him to make immediate amends for his past conduct by supplying me at once with a trustworthy and reliable guide. I went back to my old camping-ground outside the village, where presently the askari whom I had sent down with the dhow, came to report its safe arrival with all my stores after a good two days' voyage from Kionga.

The head-man sent a messenger to say that he would come and see me early next day, when he hoped everything would be arranged to my satisfaction. I was greatly annoyed at all this waste of precious time, and specially so with my head guide, Bwana Siri, who, whether purposely or otherwise, had proved himself such a broken reed.

June 8 and 9 were spent in tedious shauris with the Burkau head-men, who tried every means of frightening and turning me from my resolve to penetrate inland again. They said that the Wa-Galla living in the country behind Burkau were very bad people, and would certainly try to kill me and my

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porters if I went near them. They wished me to give them a letter saying I was going into the Wa-Galla country of my own free-will, so as to exonerate them in the event of anything happening to me. I immediately agreed; they then dropped the subject, nonplussed for the moment. Early on the morning of the second day, they returned with the new guide that they had at last consented to give.

This guide, on being questioned by me, acknowledged himself to be a slave, and when I asked him where he was going to lead us, he pointed to the southward, in the direction we had just traversed. On asking him if he was to take us by paths he replied, "No, through the bush only." I then asked, did he know the country towards the west and north-west, and he said, "No, he had never been there."

This made me lose patience; I turned round to the head-men, and asked them what was the use of such a man, it would only be repeating what had happened before; let them give me a definite answer once for all—would they give me a guide or would they not? The head-man replied, if I wanted to go into the Galla country, why did I not mention this before, as then he would have sent for the Galla head-man. I answered, how could I, a stranger, possibly know whether I would have to pass through the Galla country or not? Besides, why did he not mention the matter at the shauri I held with the head-men of that tribe?

I was getting tired of all these obstructions, and said that I would report their conduct to their chief, Mze Saif. On hearing this, they asked leave to retire for a consultation amongst themselves, and on their return made the following offer:—

They would send for the Galla head-man to come in and have a shauri with me. This I was told would take about three or four days, and as their messengers would doubtless receive instructions to warn the Gallas privately not to allow me to pass through their country, I closed the conference, and announced my intention of leaving the next day, as I saw it was their evident intention to afford me no assistance whatever; I would report the matter both to Mze Saif and at Mombasa.

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I could have forced my way through the country, but this might have led to fighting and troubles, which I wished to avoid. As far as I could make out, the head-men were afraid to let me go inland for two reasons: if I were killed they feared the Consul-General at Zanzibar; if, on the other hand, I defeated the Gallas, they dreaded the possible revenge that would overtake them after my departure. Although thwarted so far, I had by no means relinquished my original plans; indeed, the veiled opposition of the Watiku

CAMP AT BURKAU.

only made me more determined in my resolve. On thinking the matter over, I thought my best plan would be to fall back to Kionga, and from there to make another and, I hoped, more successful attempt to reach the interior.

Through my head-man and interpreter I had obtained a good deal of information about this part of the country and its inhabitants, which I summarize as follows—

There were said to be about one thousand Gallas, who were settled mostly on the river Wiori, one and a half day's march

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from Burkau. These Gallas were formerly runaway slaves of the Somalis, who now feared them as they were armed not only with spears but with bows and poisoned arrows. The Galla head-man was named Galmo, and they were settled in scattered villages, about two hundred in each. These Gallas were constantly at war with the Somalis, whose wives and daughters, cattle and sheep, they often carried off. They were the only Wa-Galla I had heard of as using poisoned arrows, with which they lie in ambush to attack the Somalis; the spear being the usual Galla weapon. The Gallas were in alliance with the head-man of Burkau, who belonged to the Wa-Katwa, a subordinate branch of the Watiku, who are peculiar in not eating fish. The real head-man of Burkau was called Amudu, and was a brother of Avatula of Jongeni, the chief who was then in rebellion along with the Witu pretender Fumo Omari. The Watiku, I was told, feared the Wa-Galla; and if their slaves ran away to the latter, did not dare to reclaim them, while the proximity of their shambas to the Galla country made it more politic for them to keep at peace with them.

There was formerly a Watiku village named Bubushi near Buramanza Hill, which was destroyed by the Gallas about seven years ago. The Gallas at the same time destroyed another village, called Sheya, situated six hours' distance from Burkau, and on the other side of the river; many people were killed and many made slaves, these last still remaining in slavery, among them the brother of Amudu. This information was subsequently confirmed by Mohamed bin Saif, who said the villages had been destroyed ten years before, and that the Bajoni afterwards retaliated by fighting the Wa-Galla, and burning some of their villages.

The ruins I saw near Burkau were built by a Bajoni named Shingwia, and were the remains of a wall intended to resist the Galla attacks. The river on which the Galla villages are situated was stated not to be large, and further inland to dry in the hot season into a series of pools, and sometimes altogether.

The Gallas were said to kill many elephants with their poisoned arrows, from which it follows that bush, if not forest, must exist there for these animals to roam in. I also heard



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repeated mention of a real forest, and a large one, but the information was very vague, and, I suspected, purposely so. Mohamed bin Saif told me that the Gallas lived in a big forest, and I was informed that all the elephants came from the Galla country. A boy who had been there said there was a big forest, with trees large enough to make canoes. These Wa-Galla were said to trade only in honey and ivory.

In illustration of the fear inspired in the Watiku by the Gallas, I was told of a man from Tula having shot an elephant and taken the tusks to his village, whereupon the Gallas demanded them under threat of seizing some of the Tula children and making them slaves, as well as declaring war. The tusks were given up, accompanied by a propitiatory gift of money. I also heard that only a few days back some Gallas walked into Burkau, and killed and ate a sheep without paying for it. These facts now made me understand the reluctance of the head-man to help me to penetrate into the Galla country.

The cultivation round Burkau was chiefly metamah, a little sim-sim, and some tobacco. Cotton was not grown, but it would grow well, and the Watiku stated that the whole country from Mattaroni upwards was excellently adapted for its cultivation. The Watiku extend along the coast almost up to Kismayu, in scattered villages considerable distances apart, owing to their jealousy and distrust of one another, particularly on the part of the head-men. The names of the Watiku villages north of Burkau were—

1. Tosha, six hours from Burkau.
2. Gudaki, one and a half hours from Tosha.
3. M'Dava (an island), one hour's sail with S.W. wind.
4. Tula, also an island.
5. Shwé, another island.
6. Kwaijama, two hours south of Kismayu.

Mze Saif's authority was really only acknowledged as far as Shakan, beyond which the Waze of each village managed their affairs pretty well as they liked. Everything tends to show the gradual decay of the Watiku from their former position; they appear never to have recovered from their overthrow by the Gallas.

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The temperature during the last three days had been as follows—

| | JUNE 7. | JUNE 8. | JUNE 9. |
|---|---|---|---|
| 6 a.m., | 72° (rainy) | .....72° (fine) | .....72° (rainy) |
| 2 p.m., | 84° (fine) | .....84° „ | .....84° (fine) |
| 4 „ | 79° „ | .....79° „ | .....81° „ |
| 6 „ | 76° „ | .....76° (rain-squalls at night) | 76° „ |

I bade a final good-bye to Port Durnford on the morning of June 10, making an early start in pouring rain for Ras M'Narani, the first stage of my journey. I was very desirous to verify the truth about a reported lake said to be situated a short distance inland from this headland. It being high tide, we had to keep close along the shore, and a long wearisome tramp through soft sand across different rocky points brought us finally to Ras M'Narani, six hours after leaving Burkau. Whilst my porters were resting I went up to the knoll with the broken pillar previously described, to get a view of the country. Near the shore it consisted of low rounded grass ridges, beyond which stretched a vast flat plain covered with bush and here and there large trees rising above it. This appears to be the characteristic feature of the coast-line south of Port Durnford.

The soil of the open grass land was a very light grey sand, and became richer as you left the coast; the more rocky portions and headlands are covered almost to the water's edge with thick scrub and numerous clumps of *Sansevieria* growing in a deep red loam.

We now started for the lake, which the guides called Shamku. After leaving the grass land we had to cut our way through the bush, eventually, at 5.30 p.m., reaching a small swamp where we camped for the night. As we had been marching without food from 6.30 a.m. till 5.30 p.m., I gave out double rations to everybody. I may mention that I made it a rule only to take food when my people took theirs, and seeing me marching with them and sharing their hardships in every way, made them, I think, more willing and ready to follow me.

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I spent the next morning in exploring the country. Shamku I found was not a lake, but a series of shallow pools, which are said never to dry up, and are a noted haunt of wild elephants, traces of them and water-buck being numerous. I made the complete circuit of these pools—none of them of very large size, the surrounding country being thick bush with occasional open grass glades, the soil varying from grey loam to a light friable red, and everywhere excellent.

I left the same afternoon for Ras M'Narani, Shamku being,

CAMP AT SHAMKU.

I estimated, four and a half miles distant from this headland. As the tide was full it was impossible to march along the shore from M'Narani, so we followed a well-defined track along the coast, which is used by the Somalis to drive their cattle down for sale, and also by the Watiku on their up and down journeys. On our way we had to climb over several of the jagged rocky hills described on my journey up, reaching the old camp at Gomé la Hekwa after two and a half hours' marching from M'Narani. My tent was nearly pitched, and we were just settling down comfortably, when the porters who

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were sent to fetch water came back saying that the water in the pool was quite dried up! The guides wanted to stop on notwithstanding, but I said no, I was not going to let my people start the next morning without having had any water all night—we must go on till we found water, however far it might be.

At 6.30 p.m. we were off again, making for the well at Ras Kiambone.

At nine o'clock I halted for twenty minutes to give a rest to the porters, who, with their usual improvidence, had finished their water shortly after leaving Shamku. It was pitch dark, and I marched last, keeping everybody in front of me so as not to lose any stragglers in the dark. We did not reach the well at Kiambone till nearly 11 p.m., when I pitched my tent as well as I could myself, everybody being completely done up, some of the porters throwing themselves on their faces and lapping up the water like dogs. What would it have been had I given way and remained at Gomé la Hekwa without any water all night, and a hot march in the sun afterwards!

I saw that everybody had water, and then at 1 a.m. enjoyed a well-deserved supper of tea and a tin of Chicago beef, falling fast asleep afterwards in my camp chair. The porters slept all round me just as they had thrown themselves down, with their loads scattered all about, and no wonder, for we had marched nearly twenty-five miles that day and had been ten hours without water.

The temperature to-day was—6 a.m., 73°; 10 a.m., 84°; 12 noon, 87°; 6 p.m. (no reading—a night march).

The next morning I told the men that I would buy them some sheep when we got back to Kionga, when they should have a big feast to make up for all the hard times we had lately gone through. This put new life into everybody, and at 8 a.m. we were well on the way on our final march to Kionga.

With our last experience fresh in my mind, I asked Bwana Siri how on earth the natives managed when travelling up to Burkau overland in the dry season? He said they would start from Shakan at about 4 p.m. and travel all night, carrying

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a gourd of water with them, and arrive at Burkau early on the following day. That there is no real scarcity of water along this coast is evidenced by the fact, that besides Shamku there is said to be another lake about one day's march inland from Shakan, called M'Bawe—in fact, the same described to me by Bwana Siri on my first visit to Mattaroni.

On my way down to Shakan I noticed with interest some coco-nuts lying here and there on the shore, evidently washed up by the waves—indeed I had remarked them both on my up and on the downward march from Port Durnford. There were both green and mature ones, but all had been spoilt by their long immersion in the water. I expect the casuarina trees that are found scattered here and there along the coast are sown in this manner.

We were once more welcomed at Shakan by the Waze, and here I left Bwana Siri in the bosom of his family, he promising to rejoin me at Kionga, where I proposed remaining for some days. I reached the latter place at noon, and after choosing a good site for the camp on the sea-shore to the north of the town, I went off with my interpreter, Rashid, to speak to the Waze. They expressed great regret at the action of the Burkau head-man, and said he was "*m'baya sana*" (very bad), and that Mze Saif would be sure to punish him; they promised to send off a messenger immediately to summon Mohamed bin Saif, who was at present at Homwé. I appreciated some green coco-nuts which they presented me with; I had not tasted one, it seemed to me, for months!

I was pleased to find the dhow, which I had sent off from Port Durnford with my extra loads and some sick porters, safely anchored in the bay.

Next day, on examining my stores that had been left here, I was much vexed to find that a good deal of rice had been stolen; it was supposed to have been under the particular charge of Mohamed bin Saif! This worthy gentleman arrived in the evening, and was profuse in his expressions of regret at what had happened at Burkau. The man would be severely punished, and if I wished to return there I might be certain that I should meet with no further difficulty. I told him I would certainly not go back, but proposed instead to strike

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inland behind Homwé, and that I counted on his help in getting my spare loads carried up there.

This seemed to take him aback somewhat, but after a pause he declared his readiness to do all he could to help me. I therefore arranged for the dhow to land my goods opposite Homwé, whence Mohamed bin Saif's people would carry them inland.

After my late experiences, I was somewhat distrustful of the two Watiku guides, and I had no doubt in my mind that, both being Wa-Katwa, their sympathies and feelings had been entirely with the Burkau people, the head-man there being of the same tribe as themselves. I therefore looked about to find a more reliable man, and was fortunate in obtaining the services of a guide named Nasur M'Barak Jubri. Nasur was formerly an askari in the Sultan of Zanzibar's army, but was now settled here, having married a Watiku wife. He lived by elephant-hunting, and knew all the country to the southward as far as Itembe. In a talk I had with him on the subject, he suggested that I should first go to the Homwé shambas three and a half hours' distance from Kionga, camping there till I had got up all my supplies from the coast, and then strike inland towards the Mundane Range, where he said the forest begins; that I could form another camp there, and proceed afterwards as the appearance of the country and circumstances might decide.

On Mohamed bin Saif's next visit to my camp, I sent for Nasur, and arranged the details of my journey to Homwé and the situation of my proposed camp. Whilst we were discussing this, Bwana Siri arrived from Shakan, and I availed myself of the Watiku chief's presence to get rid of him then and there, telling him I should not require his services any longer. Mohamed bin Saif appeared very averse to this, and said he did not like going against his brother, Mze Saif's, wishes; Bwana Siri remarking that he had been ordered to take me up to Burkau and then bring me back to Itembe. Eventually it was arranged that Bwana Siri should accompany me to Homwé, and from there proceed to Itembe to inform Mze Saif of all that had occurred since I had last seen him. I was only too glad to get rid of the man under any pretext, for he had proved himself utterly useless and unreliable.

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Toddy was not procurable here; I had tried to get some for making bread. The coco-nuts growing in the town, although luxuriant enough, were very few in number, not more than thirty or forty trees altogether. Sheep and goats, too, I found very dear; I bought four for my people's promised feast and paid the following high prices for them—

| | Rupees. | Annas. |
|---|---|---|
| 2 goats ... ... ... ... ... | 12 | 12 |
| 1 large sheep ... ... ... ... | 9 | — |
| 1 smaller ... ... ... ... | 6 | — |
| | 27 | 12 |

At first they wanted eleven rupees for the large sheep!

I had now been three days at Kionga, and all my arrangements being completed I prepared to start on the morrow, June 16, for Homwé. In the evening Mohamed bin Saif came to pay a final visit; I regaled him with coffee, sweet biscuits, and cigarettes, giving him besides a bottle of coffee, biscuit and jam tins, and another complete suit of clothes which he expressed a wish for, although this greatly diminished my very scanty stock of wearing apparel. I promised to send him an English watch when I got back to Lamu, and this was afterwards duly sent to him.

In return he faithfully promised to see all my belongings safely sent off to Homwé and carried up to my camp, but all these fine promises turned out to be mere words; for eventually I had to settle everything with the captain of my dhow, who declared that nothing whatever had been sent to him; I also had to hire a fishing-canoe to carry down the balance of my goods. This is a sample of the Bajoni character; I found them always very full of promises, but deceitful and treacherous.

Having got rid of Mohamed bin Saif, I was next interviewed by the Kionga Waze, who came to ask for a written testimonial to say that I had been well treated by them, winding up with a request for a present, which these people asked for in the calmest and most bare-faced manner possible!

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The temperature record during these last three days was as follows—

| June 13. | June 14. | June 15. |
|---|---|---|
| 6 a.m., 76° ... ... | 76° ... ... | 76° |
| 10 a.m., 82° (Fine) ... | 82° (Fine) ... | 81° |
| 4 p.m., 78° ... ... | ... ... ... | 81° |
| 6 p.m., 77° ... ... | 79 ... ... | 79° |

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## CHAPTER XXV

### SECOND ATTEMPT TO REACH THE FOREST

Renewed start Inland—Niambwé Village—Camp in Bajoni Plantation—Breaking the "Charm"—Watiku Agriculture—The Wa-Boni Country—Watiku Intrigues—Soldier Ants—Mohamed reappears—Forest at last—Indiarubber Vines—Gleaning Information—Rain and Swamps—The Dodori River—Disquieting News—An Armed Force—Untrustworthy Guides—Fumo Omari—A Retreat decided on—A Caravan of Indiarubber Collectors—A Satisfactory Bargain—Illness—Kind Friends—My Faithful Dumgu—Loyalty of my Porters—Homeward Bound.

ON the morning of June 16 I set out once more on my second attempt to find the forest.

On leaving the town, the path plunged at once into the surrounding thick bush, our direction being almost due west, past a small pond or swamp, where the Kionga people get their water supply, as the well in the town is slightly brackish. About three miles further on we came to the village of Niambwé, the intervening country being thick dense bush, in the undergrowth of which I noticed much guinea-grass. Counting the one already mentioned, we had passed by four swamps or pools, shallow circular depressions surrounded by open grassy spaces, the soil everywhere being a light friable grey loam with a light chocolate to reddish subsoil, very porous and free.

Niambwé was a small and evidently a temporary village, used for cultivation purposes, the walls of the houses being made of metamah-stalks only, and surrounded by a large area of cleared land ; apart from the usual bean and other cultivation, I noticed that each house had a small plot of tobacco.



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Leaving this, our way led for the next hour through some of the thickest bush I had yet seen, the larger trees being also finer and bigger. Emerging from this, the path lost itself in what was once cultivation, but now completely covered with a dense tangle of prickly scrub and creepers, through which it was necessary to hack our way. From the middle of these old shambas, originally cleared and cultivated by the Kionga people, I obtained a good view of the surrounding country by climbing a tree; it appeared to be thickly wooded, with a

KIONGA—PORTERS WAITING FOR THE ORDER TO START.

steep ridge showing up in the distance. Leaving these shambas, we got into thick bush again, through which we continued to make slow progress as there was no path.

About one o'clock in the afternoon we suddenly emerged upon extensive metamah fields, where, on high platforms placed here and there, slaves were already watching the grain and protecting it from birds. On inquiry, it turned out that these were the Homwé shambas, and belonged to Mohamed bin Saif. Making our way through the high millet-stalks, we camped by a swampy pool which lay in the middle of the

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plantation, and round which rice was being grown. When I heard that Homwé was only about two hours distant from here, immediately my tent was pitched I despatched my head-man Dumgu with all the porters to bring the loads from that place, whither Mohamed bin Saif had promised to have them carried from the dhow.

In the evening the corporal of the askaris came and reported to me that he had heard Bwana Siri trying to dissuade our new guide, Nasur, from taking me through Niambwé, and also from passing through this metamah shamba! As he was leaving us so soon, I thought it best not to take any notice of this. The following morning the thermometer marked 64° inside my tent at 6 a.m.; this was the lowest reading I had yet registered, the air feeling quite fresh and bracing, indeed quite cold.

This proved an eventful day. First, the head-man of the Wa-Boni living near here came to see me; I was delighted, as I hoped to see more of this tribe as I went on. I was still talking to him when, at about nine o'clock, Mohamed bin Saif suddenly arrived from Homwé accompanied by a large following of natives. I saw at once something had happened, and this is what it was. It appeared that I had unwittingly committed a deep offence against Watiku customs by camping in one of their metamah fields. Mohamed bin Saif remarked that he did not mind, but the owners of the neighbouring shambas said that they had closed them against birds, elephants, and buffaloes, and now my coming had spoilt it all!

I asked how? He said that if a man brought salt into a shamba, washed himself or defiled it in any way, it broke the charm and another medicine was required; the long and the short of it being, that a money indemnity was wanted. I thought they were trying to impose on me, but, to shield the guide Nasur who had brought us here, I said I was unaware of the custom or I would not have come, and asked how much I had to pay. I was told it was customary to kill a cow or a bullock, whereupon I offered fifteen rupees, Mohamed bin Saif having the grace to look ashamed as he took it.

My head-man Dumgu, who was at Homwé when Mohamed bin Saif received the news of my being camped in his shamba,

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told me afterwards that he was greatly enraged, and exclaimed, "If it was another European I would go and fight him for having dared to do such a thing, but as this *Bwana* has treated me well I will not fight against him, but shall ask for money."

Of course there was trouble about getting up my loads, but I will not inflict these farther details upon the reader; suffice it to say, that as usual Mohamed only partly fulfilled his

CAMP IN MOHAMED BIN SAIF'S METAMAH SHAMBA.

promises; however, the loads arrived at last, brought up mainly by my own people, and we then prepared to move onwards.

Whilst my porters were packing the loads, I obtained from Mohamed bin Saif the following information on the system of agriculture practised by the Watiku. The varieties of metamah known to them are—1. Bechai and Mnagana (both varieties of *Sorghum vulgare*, or Guinea corn); 2. Metamah wa Pembe (*Pennisetum typhoideum*). The first two appear to

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be most cultivated, and are most usually found in an ordinary metamah shamba, and take on an average one hundred and ten days from sowing till harvest. The metamah wa Pembe is said to take only sixty days, but is smaller and bears a lighter ear.

I next inquired when the present field would be ripe. He said in about thirty days it should be ready for harvest: thus, according to their reckoning, this field would have been sown late in March, and the harvest would take place in the middle of July, a full month earlier than in the Melindi district.

Sim-sim is sown as a first crop conjointly with metamah.

On my asking how many times in the year did they sow it, I was told that no record was kept; when a field was harvested it was sown a second time, but as far as I could make out, the average is two crops a year—once at the commencement of the wet season, and again immediately after the metamah harvest. All the sim-sim I saw growing was young and not yet in flower.

The remainder of the cultivating season is taken up with the growing of beans (*kunde*), etc.

Rice they cultivate in accordance with the Swahili custom, in any suitable hollow or swamp where water lies.

Ground-nuts I saw only at Homwé; they do not appear to be largely grown, though the calcareous soil is particularly adapted for their cultivation.

I finally got rid of my two Watiku guides, Bwana Siri, as I learnt afterwards, telling Nasur as he left that he was very glad that he was no longer our guide, as we should be sure to be attacked by the Wa-Boni.

All being now ready, I bade Mohamed bin Saif what I heartily hoped was a final good-bye, and we made our way to the "Dia Kuu," "the big path," as it is called, leading to the Wa-Boni country. A Watiku, who said he was going to his rice shambas, accompanied me, together with the Wa-Boni headman, who had sat an interested spectator throughout my interview with Mohamed bin Saif, and who now offered to lead me to a good camping-place on the other side of the wooded ridge below which the metamah shamba was situated.

We now travelled over what may be called, for Africa, an

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excellent path, which my guide said was the direct road from the coast into the Wa-Boni country, leading through thick bush over the ridge called M'Wekundu, a lower range of the Mundane hills. I remained behind to take some bearings—and on descending the ridge found my head-man had established our camp under some fine large trees, the first I had seen for some time, in a flat open country covered with rank high grass and tangled vegetation, with frequent swampy hollows. The soil was a good grey loam.

The distant sound of slaves shouting to frighten the birds, showed that the Watiku possessed some more shambas round here—chiefly rice-fields, I believe.

The moment I reached my camp my interpreter Rashid told me that he had been having a talk with the Wa-Boni head-man, from whom he had learnt some curious information, viz. Mohamed bin Saif had strongly urged him not to help me or give me any information whatever, as I had come into their country with a bad purpose. Rashid believed this to be true, as he had seen the two whispering together. The Watiku who had accompanied us from the shamba had also warned the Wa-Boni head-man against us, saying that we had come to spoil their country. On hearing this, my head-man, Dumgu, had turned the Watiku out of the camp, and thus matters stood on my arrival.

I immediately sent for the old Wa-Boni head-man, whose son, a lad of about eighteen, was with him. I began by making him a small present, and then asked him what Mohamed bin Saif had been speaking about, but he seemed too frightened to speak. To give him confidence I told him, through my interpreter, all I could think of to convince him of my peaceful intentions, saying that all I wanted was a guide, whom I should treat and pay well, to show me their country. I further offered, if the old man liked, to take his son with me to Lamu, and send him back safely with many presents to his people. They listened attentively to all that was said, but would only say that they would talk the matter over and bring me an answer next day. I had laid stress on the question of a guide, as Nasur, who was present, said that although he was prepared to follow me anywhere, he did not know the

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country on this side of Mundane range very well, and wished to have a Wa-Boni with us.

As if the day had not been tiring enough, the *siafu* or soldier ants caused me to spend an equally lively night. It turned out that my tent had been pitched across one of their tracks, and I found that not even fire will turn them out of their course; three times was I invaded by thousands of them, and before I could get rid of them they had bitten me well;

SHAURI WITH THE WA-BONI HEAD-MAN.

every bite is like a red-hot needle running into you, and the little fiends have to be picked off one by one. After the second invasion I had had a ring of fire made round my tent, but alas! at 4 a.m. they suddenly swarmed all over me and my bed again, and it took me some time to get them out of my hair! They had actually burrowed underneath the fire rather than turn aside out of their course. What with the Watiku and the *siafu* combined, life just then did not seem worth living, but I could not help laughing at the yells of my porters, who were likewise suddenly attacked.

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The temperature for this day was:—6 a.m., 64°; 2 p.m., 84°; 4 p.m., 81°; 6 p.m., 76°. The place where I camped was called Homwé, and, I reckoned, about thirteen or fourteen miles distant from Kionga.

The next morning on getting up I was pleased to hear that the old Wa-Boni head-man had not only returned, but brought some of his people with him, amongst them several women, who at first showed great fear of me, as they said

WA-BONI WOMEN.

that I was the first white man they had ever seen. The Wa-Boni appear to dress like the Watiku, wearing the same cotton clothes; some of the women had silver bracelets on their arms; they also speak Watiku Swahili, much corrupted from the original language. The men carried bows with poisoned arrows, the heads of these being very broad at the base. I had only just begun to talk to them when, to my utter astonishment, who should suddenly arrive but



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Mohamed bin Saif! I received him courteously, and asked him to what I was indebted for this unexpected visit? He said he had come to look at a rice shamba of his close by, but I think it much more probable that his visit was prompted solely by a strong desire to know what I was up to!

Mixing so much with these crafty Watiku had begun to make me quite an expert in dissimulation too, so turning to Mohamed bin Saif and pointing to the Wa-Boni, I remarked smilingly that he could not have arrived more opportunely, as I wanted to get a guide from these people, and he could bear witness that my intentions were quite peaceful and honest, my sole wish being to visit and explore the country.

Mohamed bin Saif was caught in his own net; he could not in the presence of my interpreter and porters, who were amused onlookers, speak against me before my very face, so, very unwillingly, as I could plainly see, he told the Wa-Boni that I came as Mze Saif's and his own friend, and that they were to give me whatever guides I required to take me where I wished. This was very satisfactory. Mohamed bin Saif got up to go shortly afterwards, and in bidding me good-bye inquired eagerly what I was going to do, and where I proposed going to from here; to find this out being undoubtedly the purport of his visit.

As soon as he had left I resumed my conference with the Wa-Boni, who had now become much more friendly and at ease. They said the Watiku were stronger than they were, and often proved hard masters, but that Mohamed himself was good to them, one of the younger men adding that Mohamed had given him a gun to shoot elephants. I asked who the ivory belonged to when they killed an elephant. "To the Watiku," they answered.

I then renewed my request for a guide, but they still appeared afraid; at last, after a good deal of palavering, the old head-man, who was called Gomo, exclaimed: "Show me the presents you are going to give me, and I will then go back to my village and bring a guide." I called privately to Nasur, my Arab guide, to know whether I could trust them, as after receiving my presents I might never see them again; Nasur, however, said they might be trusted, so I accordingly

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presented them with the following, which I spread out before them—

10 rupees in money,
1 large tin full of sugar,
1 load of rice,
1 table-knife,
1 tumbler,
1 looking-glass,
and some empty medicine-bottles.

MY PRESENTS TO THE WA-BONI.

The Wa-Boni were delighted, and the old man shook me vigorously by the hand, saying—"Let me go back to my village; you stop here to-day, and I will bring my own son to guide you to-morrow." So this was settled, and the Wa-Boni departed in high good-humour. Late in the afternoon Mohamed bin Saif returned. He asked no questions as to what I had settled with the Wa-Boni, probably having already found out all about it, and for all I knew, had very likely been at their village. In any case I

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felt sure he had tried his utmost to stop or hinder my plans in some way. After a brief rest he went away, and I bade him this time a final farewell.

I made my preparations for an early start next day, and was kept busy re-packing my loads, of which I had to leave twenty-one behind me, and to send back for them from my next camp, in the meanwhile leaving three askaris in charge. I took care, remembering the *siafu* ants, to have my tent re-pitched in another place. The surrounding country was not very picturesque, and I was struck with the numbers of euphorbias or candelabra trees growing about here. The temperature this day was—6 a.m., 71°, rainy; 4 p.m., 79°, rainy; 6 p.m., 72°, rain at night.

We had everything in readiness early next morning, but there was no sign of the Wa-Boni guide, and I was just about to send Nasur off to look for him, when the old man arrived. He explained the delay, saying that at the last minute his son had been afraid to go, so he had come instead (I wonder if Mohamed bin Saif had anything to do with this?). We eventually got away at 9 a.m., proceeding for the first mile parallel with the Mundane hills, all thickly wooded, and lying about a couple of miles away on my left. The country was at first grassy and park-like, studded with low trees, lanky euphorbias, and clumps of bush. The grass was very luxuriant and high; the lay of the country very flat, with numerous swamps—excellently adapted for either rice cultivation or American rubber—the soil a rich black to dark grey loam. Half-an-hour beyond, my eyes were at last gladdened by the sight of actual forest ahead, my porters all turning round and shouting out to me—"Big trees, big trees at last!"

Before reaching it, however, we had to wade through an extensive grassy swamp, the water being well over our knees, and it took us a good half-hour to get through it. Emerging from this we entered the forest of fine large trees, growing closely together; round the stems of many, india-rubber vines (*Landolphiæ*) were climbing. We had to cut our way through the thick undergrowth, and came out on another large swamp beyond, the water in places being over 3 feet deep; into this we went, and waded across, keeping the forest

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on our right. The swamp was covered with high grass, the soil being the same rich black to dark grey loam. Leaving this and the forest behind, we entered on more open country with much euphorbia, low bush clumps, and occasional large trees, passing shortly afterwards a well-worn path, which our old guide said led to Itembe—we were now following a Wa-Boni track—but on starting we were taken a long detour to avoid passing through some Watiku shambas.

IN THE WABONI COUNTRY—WAITING FOR GUIDES.

From here onwards the country continued open, grassy, and slightly undulating, with bush clumps and scattered large trees, amongst which I recognized once more the familiar Hyphæne palms. The land was still very flat, and we passed through numberless swamps, some of large size, and generally covered with a thick growth of grass, often 5 feet high. The soil everywhere appeared very fertile, and judging by the numerous dead tree-stumps we had passed, the relics of former Watiku cultivation, I am inclined to believe that the

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whole of this country must at one time have been covered with forest.

At 1 p.m. we entered another fringe of thick forest, indiarubber vines being very numerous, and some as thick as my arm; large game tracks also abounded, particularly buffalo, though I did not see any of the animals themselves. Coming out of this, we entered once more on a low, flat, park-like country, with frequent traces of former cultivation, and finally, at 2.30 p.m., reached a Wa-Boni village, a mere cluster of two or three huts, camping under a large tamarind tree. On remarking on the small number of huts, old Gomo informed me that it was the Wa-Boni custom; all the men living here were away just now collecting rubber.

Having to send back for the twenty-one loads left behind, I had purposely made a short march this day. The impossibility of purchasing food as I went proved a great hindrance to rapid marching, as I had necessarily to carry all my supplies with me. After my people had had a rest, I picked out twenty-one porters, and sent them back under an escort with Nasur as guide; they were to sleep at my last camp and bring on the loads in the morning, I remaining here until they returned. I spent the rest of the day in talking to old Gomo, who also brought his brother to see me, he being the head of this small Wa-Boni settlement which he called Kavé. They gave me much interesting information about themselves and this portion of the country.

From what I gathered, it appears the Wa-Boni undoubtedly fear the Watiku, who consider themselves their masters, employing them to watch their outlying shambas and the slaves working upon them; they have besides to hunt and bring back any slaves that may run away. As there are no runaway-slave settlements up here, the fugitive slaves generally make for the various Wa-Boni villages. If there is any delay in catching runaways the head Wa-Boni of the nearest village is taken down to the coast and kept in chains as a hostage till the slaves are caught. The Wa-Boni have also to lead all the Watiku rubber-gatherers to the likeliest places, and they generally live in the Watiku villages during their stay.

The Wa-Boni are not cultivators, but spend all their time

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either in collecting rubber, or in hunting, and whenever they kill an elephant, one tusk is claimed by and has to be given up to the Watiku. At harvest-time it is their custom to go down to the Watiku shambas and help in the reaping of the crops; they are paid in grain for their work.

Judging from their extensive shambas, the Watiku must possess numerous slaves, and this may have been the principal reason for their strong objection to my passing through their shambas; they would naturally wish to keep this fact hidden from the observation of a European, especially one in the service of the Company. Both my interpreter and head-man, under my instructions, talked to these slaves whenever they got a chance, and from what they told me, the majority of them were Wa-Kamba, Wa-Druma, but chiefly Wa-Teita, but how or when they came they had no remembrance.

As to the country, they confirmed my surmise that all this land was originally forest, which was destroyed by the Watiku in making their shambas; the annual burning of grass and bush in the dry season forms a constant check on the growth of vegetation. The country to the west and north-west was also originally forest, which still exists to a small extent; thus a strip of forest is followed by open country, with another stretch of forest, and so on. Wherever there is forest, india-rubber is plentiful; even in the smallest patch the vines are to be found. To the north the country is chiefly open, and any one proceeding for ten days' march in that direction would come to the land of the Wa-Galla and Somalis. The Wa-Boni do not go there, not because they are afraid, but because it is too far off.

Old Gomo then told me that he was very sorry, but he must go back to-morrow, as Mohamed bin Saif was his lord and master, and that he had one of his shambas to watch, but his brother would lead me to-morrow to another Wa-Boni village, at two hours' distance from here, where the people knew all the country thoroughly even up to Jongeni, and that I would be furnished with fresh guides from there. To this I agreed.

The weather had again broken, and it had rained more or less during this day and the day before; not only were my clothes constantly wet, both from the rain and the numerous

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swamps I had waded through, but my waterproof sheet having come to grief, my mattress and blanket were generally sopping wet too, and I made the best of matters by rolling myself in my blanket, previously dried before the fire.

To-day's temperature (June 19) was—6 a.m., 71°; 4 p.m., 79°; 6 p.m., 71°. Showery day, rain at night.

To pass the time till my porters returned with their loads, I started off early next morning, accompanied by my headman Dumgu, for a hunt after game, and also to explore the surrounding country. For the first mile and a half we followed the track we had travelled over yesterday. I then struck off to the south and south-east, continuing in that direction for about two hours, till we came in sight of the Mundane hills, running in one long unbroken line in an east to west direction, with here and there a higher peak breaking the uniformity of the range, which throughout appeared thickly wooded.

The general appearance of the country was park-like, but this is not uniform in all cases: in some places the traces of the original forest were much more apparent, the trees and bush growing closer together being finer and larger. Taking it as a whole, it is a rich country, with a fine fertile soil. Towards the north-west the forest-like appearance is much more marked and noticeable, and the country if left alone would doubtless very soon revert to its original state; but, as I have said, the annual grass fires prevent this. The lay of the land is very flat, and small marshy hollows are very frequent, rich luxuriant grass covering the open country everywhere.

I also noticed a great deal of *uwanga* (arrowroot); it was generally growing beneath the shade of the larger trees, some of the plants being very fine and luxuriant. Game tracks were numerous, and I saw eight topi, but they were too wild for me to get a shot at them.

On our way back Dumgu killed a snake, a nasty-looking beast, which we nearly walked over; I heard a hiss, and looking down saw it coiled up almost under my feet. I got back to camp about noon, and found the party of porters had returned with the loads an hour before. The corporal, who with an askari had also gone off after game, reported that he had gone

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in a northerly direction, and at an hour's distance from camp had come upon thick bush or forest, where he had seen a good deal of rubber, of which he brought me a sample. On examination it proved to be *Landolphia Kirkii*, yielding the pink variety, the most valuable kind commercially.

Rubber is certainly very plentiful all around here, and wherever there is a clump of trees large enough to support and shelter the vines, there they will be found growing, but many vines must be killed annually by excessive tapping, for there is no regular system of collecting the juice. Bands of men, all Watiku, rove throughout the country, and where the vines are easily got at, they are indiscriminately tapped ; I saw some growing in a forest clump close to my camp which had been greatly hacked and cut about.

At two o'clock in the afternoon I set out for the next Wa-Boni village, Gomo's brother being now our guide, Gomo having returned to his own village early in the morning. Our direction was south-west, and the characteristics of the country much the same as already described—scattered fine timber trees with occasional clumps of forest, the soil a rich grey loam. On the way we passed through some old Watiku shambas of last year's cultivation, with the remains of two Wa-Boni villages close by, thus confirming what I had been told as to the Wa-Boni being compelled to watch over the Watiku shambas.

At four o'clock we arrived at the next Wa-Boni village, which was, as I have been told, exactly two hours' march from Kavé, our way having latterly led through much thicker forest, which appeared to extend for some distance to our right. I encamped a little outside the village, being the object of much curiosity to the inhabitants. As soon as the tent was pitched and the loads piled, I called for volunteers to go back for the seventeen loads left behind at Kavé, offering one rupee extra pay as an inducement, upon which the porters came forward in a body. Their willingness pleased me so much that I promised to give a couple of rupees to each of the seventeen men I picked out, who went off rejoicing with six askaris as escort. Several of the porters were armed.

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I then had a talk with the Wa-Boni of this village, and also with two Watiku rubber-gatherers from Dodori, who happened to be here at the time. Dodori, they said, was one day's march from here. They also spoke of a river flowing close by, containing numerous hippo; on making further inquiries concerning this, they said it was the river which ran into Dodori creek, evidently the same spoken of by the people at Vaas as flowing from the Mundane hills to the sea. This was very interesting news, and as I had then a good deal to do mapping and writing out my notes, I despatched my interpreter Rashid to have a look at it. He soon returned to say that the river was only a few minutes away, and that it was fairly wide.

This was another rainy day, the third in succession, the temperature being—

| | | |
|---|---|---|
| 6 a.m., | 70° | Frequent showers during the day, and it also rained heavily during the night. |
| 10 a.m., | 79° | |
| 12 noon, | 80° | |
| 4 p.m., | 79° | |
| 6 p.m., | 71° | |

I was off the first thing next morning to have a look at this unknown river, a Wa-Boni going with me to show me the way. As Rashid had told me, it was quite close, in fact, just below the village. Where I first saw it, the clear, winding stream flowing between low banks, fringed on both sides with a belt of thick forest, the vivid greenery of the overhanging trees contrasting with the placid stream below, made quite a beautiful and striking picture, almost English and home-like in its effect. It was of an average width of fully 80 feet, and, as the Wa-Boni informed me, fairly deep. It is said to flow from the Galla country, many days' march away, and never dries. It continues hence in a winding course towards the sea, opening out into a lake before it finally falls into the Dodori creek; hippo were reported to be numerous, but there were no crocodiles.

As Dodori is the village situated nearest to its mouth, I have made this river the "Dodori."

On returning to the village I found fresh trouble awaiting

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me. The Wa-Boni came to say that they were afraid to give me guides, giving as their reason the rather startling information that Fumo Omari, the rebel chief of Witu, was master here, and would be very angry with them if he came to hear of their helping me. This was rather alarming intelligence, as the outlaw was the declared enemy of all Europeans.

However, with the help of old Gomo's brother, I eventually prevailed upon the Wa-Boni to furnish me two guides, two of

THE DODORI RIVER.

their young men, who, I could see, consented with unwillingness. I gave the village people a load of rice as a present, and they specially asked for cloths of the following varieties, Debwané, Sohari, and Sabaia, which I was unable to give them.

From further inquiries it appeared that the Watiku influence ceases here, it now being to Fumo Omari that the second tusk of every slain elephant has to be given up. Many of the Wa-Boni carry guns, which have been given to

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them by Fumo Omari for killing elephants. Jongeni was said to be only three days' march away. Fumo Omari's askaris patrol all this part of the country, and even on occasions go up as far as Burkau.

My seventeen porters had by this time safely returned, so I proposed starting forward again about noon. Whilst I was taking an early breakfast, Rashid suddenly appeared with the news that ten armed men had suddenly appeared in the village!

THE DODORI RIVER.

I told him to bring them to me at once; they presently sauntered up in the most free-and-easy manner. In reply to my questions they said they were indiarubber gatherers who had come from Kionga, and that they were now on their way back to Faza. I professed to be satisfied, and they retired. Rashid said he was sure this was all lies, as he and the corporal had recognized the two leaders of the party, one of whom was no less than Mohamed Bafaro, the brother of Avatula of Jongeni, one of the principal leaders of Fumo

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Omari's men, the other being Amadi Koropana, another well-known bad character, whom Rashid had noticed in Mohamed bin Saif's following at Homwé metamah shamba. This man Amadi had also been at Jongeni, and had lately been imprisoned by Mr. Rogers at Lamu.

Rashid presently got hold of Gomo's brother and questioned him further about these men; he confessed that it was unusual for a party of professed rubber-gatherers to carry so many guns. I could not see that anything could be done about this, except to be on the alert, so my loads being packed I prepared to start at the time I had already fixed. As I found we had to cross the Dodori, I arranged to carry as many loads as I could to the river, impressing all my askaris as well as porters, and then sending back again for a few loads that were left behind. We got away at 12.30 p.m., the armed party of Watiku remaining in the village watching our departure. The path led off through the forest, with fine trees growing thickly and closely together; here again I noticed a good many rubber vines. Emerging from this, we proceeded through alternate belts of forest and grass glades, some of the latter very swampy and low, a thick fringe of forest continuing on my right. The course of the Dodori, along which I was marching, could be traced by the belt of forest growing upon its banks. Occasional clumps of ebony trees were to be seen here and there in the more open country, which, with its scattered fine trees and undulating downs, covered with bright green grass, made up a charming landscape.

At two o'clock the path reached the river, which our guides, who had been very sullen, said was here crossed by a tree purposely felled across. Here I halted, and immediately sent back the number of porters required to bring on the loads left at the village, and as I feared possible trouble, I sent the corporal in charge of them, whilst I remained to supervise the crossing of the river. The stream here was 4 feet deep and from 20 to 25 feet wide, and quite overgrown with overhanging trees and creepers.

As the guides told us there might be crocodiles, we at first attempted to cross by the tree, but it was quite impossible to

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carry the loads this way, so I jumped in the water, and finding that nothing happened, they all eventually waded across. Leaving Dumgu, an askari, and one of the Wa-Boni to guide the corporal with his party of porters across, the rest of us proceeded.

After advancing a little way, I was sure the guide was not taking us right. I called a halt and again told the guide my wishes, that I wanted to go towards the north and north-west, whereas he was leading me due south. He said no, but that the path wound about a great deal. I felt sure, however, that he was playing me false, and I ordered a return to the river, where we got back at four o'clock. Here I camped, the corporal and party of porters arriving just as we were unpacking the loads. He made the following report—

He found the armed party still in the village, and they showed great interest in the guns carried by my men, asking what kind they were, and how many we had, and also inquiring repeatedly where we were going to. To this the corporal very properly replied that he did not know—this lay with me, his duty was to obey orders.

The corporal then pretended to start off, but when he had gone about half-a-mile he returned to the village, where he found the ten men had suddenly departed; on asking where, the Wa-Boni said half of them had gone off towards Jongeni, to meet a party of askaris reported to be one day's march from the village, the other five had gone to Homwé. Hearing this, he had hurried on to tell me. This was sufficiently startling, but now followed another complication. The two Wa-Boni guides, on being asked, refused point-blank to lead me in the direction I wished to proceed, which was to follow the Dodori to its source, keeping in a N.N.W. direction. They said they only knew of one path, the one we travelled over yesterday, and if I wanted to go elsewhere, not only would they not come, but they would return at once to their village.

I called up Dumgu, Rashid, and the corporal, and put the matter before them. Dumgu remarked that all the porters were saying we were betrayed by the Watiku to Fumo Omari, and would shortly be attacked by the latter. I told my head-

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men that it was only fair to tell them what I thought of the matter, for it affected us all equally.

We might easily establish a fortified camp here, garrison it with some of the askaris and armed porters, leaving in it whatever loads we could not carry, and then push on with the rest of the porters towards the N.W. for as long as our provisions would last out. But, as we might be from ten to fifteen days away, there was the fear that on our return we

LOOKING DOWN THE DODORI RIVER.

might find the camp in the possession of Fumo Omari. The Watiku were manifestly hostile, and the Wa-Boni appeared in equal terror of both, and it appeared evident that an understanding of some sort existed between the Watiku and Jongeni people.

Last of all, there was the added danger of Suliman bin Abdulla's presence at Jongeni. He was the former owner of the Magarini shambas. This man's hatred to Europeans was well known, as well as his often declared wish to possess a

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white man in chains. I was particularly objectionable to him from my connection with the shambas. What could my small force of ten askaris and only twenty-three guns do against the thousands of well-armed men that Fumo Omari could bring against me? My three head-men admitted this was true, but declared their readiness to follow wherever I should go. I thanked them, but said I thought it wiser to fall back, adding, "We will go on to the coast, but quietly, not as if we were afraid." This decision was announced to the porters, and we started on the morrow for the coast by short marches, to allow time to send back for the extra loads as usual.

The weather had fortunately cleared up again, and the sunshine was an agreeable change after so much rain. The temperature this day (June 21) was—6 a.m., 70°; 12 noon, 84°; 6 p.m., 73°.

Next morning at 6 a.m. the thermometer again stood at 64°, the air feeling fresh and sharp. We were now bound for the coast, and as we started off at 7 a.m. I could not help a feeling of keen regret as I looked back towards the unexplored country to the N.W. I had to leave fifteen loads behind, which we piled up under a large tree in one of the forest clumps close by our camp. Shortly after we started one of the Wa-Boni guides pretended to be very ill, asking leave to go back to his village, but I would not allow this; I gave him some brandy, and said we would wait until he got better, upon which his recovery was quite marvellous! He no doubt wished to give news of our change of plans.

For the next two hours our march continued without further incident through the same flat, park-like country, with occasional large trees and patches of forest, in most of which rubber vine was to be found; the soil was good, chiefly a rich loamy black, and the ground was covered everywhere with thick coarse grass 2 to 3 feet high. Swampy hollows were as numerous as ever, but by this time I had got quite used to wading through them, though my last pair of boots were beginning, alas! to show decided signs of wear.

Traces of old shambas were numerous, and from the large number of dead tree-stumps everywhere, there could be no

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doubt that all the country must also have been covered with thick forest at one time. At nine o'clock we were again startled by seeing a large body of men coming towards us; my porters had by this time got Fumo Omari on the brain to such an extent that they imagined they saw armed askaris at every turn.

I halted my people to receive the new-comers, who proved to be nothing more formidable than a *safari* or caravan, numbering fifty-three people, going up from Dodori to gather indiarubber. They said that they were proceeding to a forest called Gararen situated on the Dodori river, two days' marching distance from the village of that name. This forest is said to extend for a distance of two or three days' march, one man even saying that it went almost up to Burkau. I thought this a good opportunity of disposing of the fifteen bags of rice left behind, which the head-man gladly consented to buy, as they proposed stopping one month to gather rubber. He said rubber was very plentiful there. I accordingly sent Rashid and two askaris back to measure and hand over the rice, the head-man waiting with me till they returned, upon which he handed me a signed order on Lamu, and we then resumed our respective ways. This transaction was a great relief to me, as the constant sending backwards and forwards for the spare loads had proved a great hindrance, besides being very trying for the porters.

At noon we arrived at a Wa-Boni village situated in a thick belt of forest, where I camped, for I was beginning to feel the effects of all the exposure and constant wetting, combined with the recent anxiety and worry. This day (June 22) was again fine, the temperature being—6 a.m., 64°; 12 noon, 84°; 6 p.m., 75°.

I was very seedy in the night with fever, and felt very weak at starting next morning. We got two Wa-Boni from here, having vainly tried to induce my guides of yesterday to come on to Lamu with me. I should have liked to convince them, not only of our good intentions towards their tribe, but also of our power to crush Fumo Omari, and if necessary the Watiku people as well.

The country was at first much the same in appearance as



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that passed over yesterday, but if anything more forest-like; the lay of the land still very flat and low, with the usual swamps overgrown with high grass, which, saturated with dew, wetted one thoroughly as one passed through. About three miles further on the characteristics changed entirely; the country now became covered with thick Hyphæne palm woods intermixed with occasional belts of other forest trees, and scattered open grass glades; these were very low and

LAST CAMP IN THE WA-BONI COUNTRY.

swampy. I had also noticed several clumps of ebony trees growing here and there, the soil being as a rule a light friable grey.

It was just about here that I heard shouts ahead. I was some little distance behind, taking bearings; hurrying up, I found that one of the porters, who had strayed off the path, had been attacked by wild dogs, which our approach frightened away; no harm had been done beyond the man's clothes being badly torn. I went off after them, but could not

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find them, and presently heard the howling of the pack some distance away.

We continued through much the same description of country, thick Hyphæne palm woods continuing on every side, till, after wading through an unusually large and rather deep swamp, which took us nearly an hour to get through, I quite collapsed on the other side, being sick, feverish, and quite done up. It was then nearly one o'clock. After half-an-hour's rest, I struggled on again over a flat swampy plain, the Hyphæne palms becoming scarcer as I got nearer the coast, having most probably been cut down by former cultivators, traces of old shambas being now very frequent. At 2.30 p.m. we came upon a small river flowing across our path, the water only about 6 inches deep, and 30 feet wide, and the banks about 5 feet high. Crossing it, we found ourselves on a flat open plain of low bush, with a small hill right ahead. After wading through several more swamps, and crossing the river twice again, we arrived at the ridge, descending which we found ourselves in a fine valley covered with metamah fields, through the centre of which the river flowed. At last we arrived once more at Kiongwe about 3.30 p.m., my porters and askaris laughing and shouting with joy as they entered the village, for all their troubles and wanderings were now over.

I felt so ill that I resolved to push on as quickly as I could to Lamu, as I was afraid of breaking down completely before I got there; so after a brief halt we went on to Shimbwe, which we reached at 5 p.m., and I camped there. I paid off my two Wa-Boni guides, giving each one a good present, so I think their first intercourse with a white man was of a satisfactory nature. I was very sorry not to have seen more of this interesting and evidently much down-trodden tribe.

My last thermometer readings in the Wa-Boni country were (June 23)—

6 a.m., 68° } Fine.
4 p.m., 78° }
6 p.m., 76° (Shimbwe).

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I started early next day for Wange, having sent two askaris on the night before to engage boats to take us across the Mongoni creek. I arrived at Wange at 9 a.m., two hours after leaving Shimbwe; we had passed over a rich and fertile area, covered in parts with thick Hyphæne palm woods, and also passed through some extensive rice-fields. The country much resembles that lying between Wange, M'Kauoni, and Shimbwe. Crossing the creek took a very long time, as we had only a couple of very small canoes, and the sea being

THE FORT—MOMBASA.

rough, we could only send a few people and loads at a time. I crossed the last, reaching Makumba on the other side at 2 p.m. After twenty minutes' halt we went on to M'Gini, over a flat swampy country, through thick belts of Hyphæne palms and many fan palms and low bush, all growing in grey loamy soil; then after crossing a shallow sea-creek, and ascending a low ridge beyond, we travelled across a low flat grass country with scattered bush. The soil was of a grey to black loam, with numerous tracks of big game, lion and

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buffalo, etc., in it. We reached M'Gini at 4 p.m., and the moment my tent was pitched I went straight to bed. The next morning I could not move, it was a clean collapse, so I had to remain in bed the whole of the day. I sent off half of my porters with all the askaris under charge of the corporal to Lamu, with a letter to Rogers announcing my return, and asking him to send my letters up to Jipe, where I hoped to camp next day. I passed a miserable night, and on the afternoon of the following day started for Jipe. I was unable to hire a donkey to ride, and being too weak to walk, was obliged to be carried by my porters, but after an hour's experience of that mode, I found myself so terribly jolted that I preferred to stagger along; so sending all but my faithful Dumgu and my servant ahead, I eventually managed, with their help, to reach Jipe. Here I rested another day, and then started on my last march to Lamu on June 28. Great was my gratitude and pleasure on reaching Makowe to find that Mr. Rogers had come to meet me in the steam launch, Dr. Rae of Witu being also with him. I was soon comfortably established in Rogers' hospitable house in Lamu, where I was able to recover a little from the fatigues and hardships of our long tramp of 300 miles in the bush.

I remained at Lamu until July 7, when I went on to Zanzibar in the B.I.S.N. Co.'s steamer *Java*, after a hearty good-bye from Rogers, who came to see me off, and whose cordial kindness and hospitality I shall never forget. The *Java* stopping at Mombasa on her way, I was just able to pay off the balance of my porters, for when I got to Zanzibar I broke down completely with a bad attack of fever, complicated with inflammation of the lungs. The doctor wished to send me to the hospital, but Captain Wake, second in command of the Sultan's troops, not only insisted on taking me to his house, but actually gave up his own bed for my use; indeed I have very pleasant recollections of many kindnesses received from all.

When I left Zanzibar they were already beginning their preparations for the final attack on Fumo Omari's stronghold, which, with the co-operation of the naval contingent furnished from the men-of-war on the station, was destined to be so

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successful. Rogers was the first to enter Jongeni, closely followed by Captain Wake, who was severely wounded, but I am glad to say he recovered completely after a visit home.

My faithful Dumgu had followed me to Zanzibar, and proved a most watchful sick nurse. He implored me to take him with me to England, and cried like a child when he bade me good-bye. It is always pleasant to have been able to

HOMEWARD BOUND.

inspire devotion like this, no matter what the man's colour may be, and Dumgu's unselfish loyalty during all the time that he was with me could not be surpassed.

I also gladly pay a fitting and deserved tribute to my porters, who for endurance and other good qualities have not an equal anywhere. They had accompanied me in all my wanderings, and cheerfully and loyally followed me through many hardships and sufferings. I was always kind and just to them. It is a mistake to think that harshness

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is necessary in dealing with the African native. I always found them willing and obedient.

I was well enough to be carried on board the *Java* when she left on her return voyage to Aden, and her commander, Captain Frohawk, being an old friend, I was well taken care of. I transhipped at Aden to the P. and O. steamer *Britannia*, finally reaching England, after a pleasant voyage, on August 12, 1893.

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# PART II.—ZANZIBAR AND PEMBA

## CHAPTER I

### GENERAL DESCRIPTION AND CLIMATOLOGY OF ZANZIBAR

In search of an Hotel—Sir Lloyd Mathews—Interview with the Sultan—Kinabuni Garden—Sketch of Zanzibar Island—Position—Structure and Soil—Rain-fall and Temperature—My Plans.

ON Wednesday, March 16, 1892, I arrived at Zanzibar at daybreak, having made the passage from Mombasa in the s.s. *Ethiopia*, and, like all persons approaching it from the sea, I was struck by the handsome appearance of this tropical island-town, with its frontage of white houses, public buildings and mosques, which conceal the lower portions of the town from view, whilst rising conspicuous above all are the tall clock-tower, the large square palace of the Sultan,[1] and the British and foreign Consulates.

Hearing that her Majesty's Agent and Consul-General, the late Sir Gerald Portal, was leaving at 9 a.m. for Mombasa, I went ashore at 7.30, and had a brief interview with him; he regretted the necessity of his departure, but had advised the Sultan of my expected arrival, and had requested an interview for me.

After returning to the *Ethiopia* for breakfast, I again came on shore, this time with my belongings and the five porters I had brought with me from Mombasa, and to my surprise made quite a sensation as I proceeded through the town in

[1] Both these buildings have since been almost completely destroyed by the bombardment from our ships during the brief usurpation of 1896.



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quest of an hotel, escorted by my porters carrying my travelling impedimenta, tent, loads, old baskets, lamp, bucket, flag, etc., our procession seeming to excite a lively curiosity! The first hotel I went to was luckily shut, for I did not like its appearance, and I started my procession again to another, at which I was more fortunate, and found myself made fairly comfortable under the auspices of a manageress speaking not less than eight languages! Here I engaged the extra number of porters required—always a troublesome business—and after a visit to Mr. Weaver, whom I found being well looked after by the nuns at the French hospital, I had an interview with the Sultan's Prime Minister, General Sir Lloyd Mathews. I found him extremely kind and courteous, and much appreciated the personal interest which he evinced in the object of my visit, and his readiness to facilitate my proceedings in every way. Sir Lloyd made some valuable suggestions as to the places I should visit; and advised me to call on Père Sacleux, a French priest who had been all over the island. When I called on him two days afterwards he received me cordially, and showed me the rough draft of a new map he had made, and furnished me with many valuable suggestions and hints which I found most useful afterwards. After my interview with Sir Lloyd Mathews I returned to my quarters. The weather was excessively hot.

At ten o'clock next morning I went with Sir Lloyd to the palace, and was introduced to the Sultan (Seyyid Ali bin Said), who received me at the top of the stairs outside the Durbar-hall, which overlooks the harbour. We sat round a table (General Mathews acting as interpreter between his Highness and myself), and we had a conversation of over an hour's duration. The Sultan evinced much interest in my visit, and asked me many questions as to what the Imperial British East Africa Company intended doing on the mainland. Like a true Arab, he expressed doubts as to the results of an introduction of ploughs; they would never do in Zanzibar, because there were too many coco-nut trees! His Highness kindly placed at my disposal the Chueni Palace, his country-seat about seven miles from

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Zanzibar, a handsome building close to the sea, where he has a very extensive clove plantation. One of his carriages was ordered to take me there next day, and the head-overseer was directed to give me all information required, and to accompany me over the estate.

The day before leaving Zanzibar I visited the Sultan's shamba or garden at Kinabuni, with General Mathews. It is more of a garden than a plantation, being enclosed by walls on every side. It contains a house. The garden was made, and the house built, and much used, by Sultan Seyyid Barghash, the great Sultan of Zanzibar, who died in 1888.

I was interested to see the method of irrigation practised, the water for the baths and irrigation purposes being brought from the Custom House in the town. The garden is divided in the centre by a masonry terrace about 4 feet high, ornamented with flower-pots and shrubs, and on each side of this terrace a stone channel conveys the water, which is distributed as required among the minute square beds into which the garden is divided. I observed some fine date-palms growing here; a bag is tied round the clusters of fruit when ripe, to protect them from the birds. I also noticed some fig trees. The garden is manured, and chiefly vegetables are cultivated. There were many handsome flowering shrubs, several having been introduced by Seyyid Barghash from Mauritius, and also some fine Croton plants.

Perhaps before entering upon the details of my examination of the island, it is better to give the reader a general description of its geographical position and other particulars.

The East African coast is characterized by a number of coralline islands which lie along it, and of these Zanzibar, situated between latitude 5° and 6° south, is the largest and most important. Its position adjacent to the mainland, from which it is separated only by a channel 25 to 30 miles wide, and the advantages of its excellent harbour on the western or mainland side, mark it naturally as the chief commercial entrepôt of East Africa, and the gate through which commerce, religion, and civilization were destined so largely to open up the interior of the continent. The island and port

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of Zanzibar being also about equi-distant (some 2400 nautical miles) from the Cape of Good Hope, India, and the Suez Canal, and controlling the line of our cable communication with Mauritius, affords a strategical position of future importance to our Imperial interests, as a naval base in the contingency of the closing of the Suez Canal in time of war, and constituting one of the valuable and substantial advantages accruing to Great Britain from the Anglo-German treaty of 1890. In shape the island is irregular, its greatest breadth amounting to about 27 miles, whilst its extreme length exceeds 50 miles. Its total area is estimated, in the absence of a thorough survey, at 400,000 acres. Zanzibar possesses no mountain range; rising in undulating hills from the coast, the low ridge which traverses the island from north to south has by measurement been proved not to exceed a height of 400 feet. "The formation of the island," says Dr. James Christie,[1] "is coralline, erected on a bed of stratified sandstone. . . . The madrepore structure is evidently based upon the summits of an abrupt and sharply rising submarine range, which, of course, must have been under the ocean-level at some remote period. By the action of the gradually subsiding waters a coralline conglomerate has been formed. On the southern and eastern parts of the island the deposit is more scanty, merely filling up the interstices of the coral rag, leaving exposed the bare summits and making travelling on foot exceedingly difficult. Where sufficient deposits have been left, the soil is fertile and the crops early; the porous understructure carrying off superfluous rains, but still retaining moisture and heat; Zanzibar, like all other madrepore islands, grows towards the leeward, and on that side the most fertilizing deposits take place. Thus the barest and most unfertile parts of the island are those exposed during the greater length of time to the influence of the long-continuous south-west monsoon; and the most fertile are those sheltered from the violence of the south-west and exposed to the north-east. With a superstructure of this kind based upon ancient sand-

[1] *Cholera Epidemics of East Africa*, by James Christie, A.M., M.D., containing an excellent chapter on the meteorology and climatology of Zanzibar.

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stone formations, it is quite evident that the immense annual rain-fall cannot be drained off superficially to the sea by the swollen stream-beds, but that a very large quantity must percolate through the superficial sandy deposit, and then through the reticulated porous coralline structure, collecting . . . in the hollows of the stratified sand-rock."

Whilst the meridional hill-range, mentioned above as running the entire length of the island, presents a striking picture of beautiful tropical vegetation, and much of the soil of Zanzibar is most fertile, the geological characteristics just quoted prepare one to learn that a great part of it is barren. In fact, on the authority of Père Sacleux, who possesses an intimate and thorough knowledge of the subject, the sterile portion covers the larger part of the island—extending over the coast-lands of the eastern side, and nearly all the southern portion—and consists of a universal outcrop of sharp and jagged coral-rock; but even there the land is everywhere covered with low bush vegetation and grass.

One explanation of this extensive area of sterility is, as suggested by Dr. Christie, the fact that these portions of the island are exposed during five months of the year to the full violence of the south-west monsoon. Should this cause be established—and there is much to support it—it would certainly become a question of importance whether, by a system of judicious belts formed of quick-growing trees, the force of the monsoon could not be neutralized, and a certain portion of this barren area reclaimed for cultivation. The fertile area covers the whole of the western and northern side, as well as the eastern face of the central hilly ridge; here and there occur scattered barren areas of small extent, called "waanda" or "wangwa."

Zanzibar and the other coastal islands (Mafia, Pemba, etc.), as well as the mainland, are inhabited by the half-caste Swahili, a race of mixed Arab and African blood; the Arab intermixture has become so strong that the Swahili commonly speak of themselves as Arabs, and are so regarded wherever they, as traders, penetrate into the African interior. Besides the Swahili, who form the basis of the population, there are

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(especially in the town of Zanzibar) numerous members of other Asiatic and insular races, such as Comoro men, natives of Madagascar, Arabs from Oman and Hadramaut, and natives of India—Banians, Parsees, and Portuguese half-castes from Goa. A few of the Bantu aborigines still remain on the east coast, and it is in the unfertile districts of Zanzibar that the original inhabitants of the island survive; they are called the Wahadinu. The population of the island (of whom a third live in or near the town) is estimated at from 250,000 to 350,000.

In Zanzibar, as in other countries in the tropics, the rains follow the sun, commencing soon after the sun has passed its zenith. There are thus (as in the coast-lands) two rainy seasons in the year, the "greater rains" (Mazika), which culminate in April or May; and the "lesser rains" (Muli), which last from October to November or December. There are also, in Zanzibar and Pemba, what are called "after rains" in July, which are anxiously looked for by agriculturists; these rains do not appear to occur on the coast-line of the mainland, although they are found in Uganda, 800 miles inland. The amount of rain varies greatly from year to year, for while the average at Zanzibar is 64 inches, the annual amount has been found to vary from 46 inches (in 1874) to 167 inches (in 1859), and there seems to be some justification for the opinion that the rain-fall has become less and less with increasing cultivation.[1]

Until the accuracy of the earlier and apparently imperfect records, giving the total annual *rain-fall* at from 85 inches to 167 inches, is established, I prefer to accept the result of the five years' careful meteorological observations taken daily by Dr. John Robb on Ras Shangani, the point of land in the middle of the west coast, on which the town of Zanzibar is situated. The measurements from 1874 to 1878 give an average yearly fall of 61 inches. As will be seen from the table annexed, the fall is most evenly distributed, Zanzibar feeling the influence of both the south-west and north-east monsoon.

[1] See the valuable and interesting Report on Meteorological Observations in British East Africa for 1893, by E. G. Ravenstein, F.R.Met.Soc. (George Philip and Son, 1894).

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*Rain-fall—Monthly Results for Five Years, 1874-78, by John Robb, M.D., P.M.S.*

| Months | Amount | Greatest Fall | Number of Days | Prevailing Winds and Remarks |
|---|---|---|---|---|
| | In. | In. | | |
| January . . | 2·33 | 2·03 | 7 | N.E., E., calms ; S. |
| February . | 3·00 | 2·70 | 8 | N.E. ; E. in afternoons. |
| March . . | 5·92 | 2·47 | 12 | N., N.E. ; variable S. |
| April . . . | 14·84 | 3·74 | 17 | Southerly to W. and E. |
| May . . . | 6·95 | 3·77 | 12 | W.S.W., S.S.E., S. |
| June . . . | 2·09 | 1·63 | 6 | S.W. to S.S.E., E. |
| July . . . | 2·32 | 1·95 | 6 | W.S.W., S., S.S.E., N. |
| August . . | 2·49 | 3·22 | 8 | W., S., E., variable, calms. |
| September . | 1·86 | 1·22 | 9 | W., E., S. ; calms, Northerly. |
| October . | 3·75 | 2·52 | 9 | S., E., N. ; calms, variable. |
| November . | 7·39 | 4·63 | 14 | S.E., E., N. ; calms, variable. |
| December . | 8·06 | 4·74 | 13 | N.E., N.; steady, calm mornings. |
| Average for year | 61·00 | 4·74 | 121 | |

Assuming the rain-fall record of 1859 (167 ins.) to be accurate, Dr. Robb is inclined to attribute the decrease to the great destruction of trees on the island by the cyclone of 1872. Mr. E. G. Ravenstein, it will be observed, suggests the result is owing to increased cultivation. Sir John Kirk notices the same fact when he says that "if reliance is to be placed on observations taken forty years ago, the rain-fall has since then diminished to about one-third of what it then was. In confirmation of this we know that there has been a gradual and marked diminution during the last thirty years."[1]

The question of the connection between trees and rain-fall is a much-disputed one. Personally I share the opinion contained in the following extract—[2]

"Forest is plentiful because rain is plentiful, but the converse of the proposition is not true. Plentiful rain will not follow abundant forest. Over a large portion of Ceylon, and much larger portions of India, natural forest is scarce or absent, because of the paucity of rain. To produce forest artificially in such districts is difficult, but not impossible.

[1] *Kew Bulletin*, No. 64, April 1892.

[2] "Forest and Rain-fall" : *Tropical Agriculturist*, July 1891.

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Success will secure many beneficial consequences; amongst the rest, economy of moisture by reducing floods and evaporation; but we are utterly sceptical as to any appreciable increase of the deposit of rain from the atmosphere by any process of afforestation which can be carried out."

Sir John Kirk gives in the *Kew Bulletin*, already quoted, the means of meteorological observations (reduced to sea-level) taken in the town of Zanzibar in the five years 1880 to 1884, inclusive. These observations were taken with reliable instruments, and were corrected for index and other errors at the Observatory, Bombay—

*Means of Meteorological Observations (reduced to a sea-level) taken in the Town of Zanzibar in the five years* 1880 *to* 1884, *inclusive.*

| Month | Mean Maximum | Mean Minimum | Approximate mean Temperature | Extreme Range | Barometer (reduced to sea-level and Temperature 32°) | Humidity | | Rain-fall | Number of Days on which rain fell |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 10 a.m. | 4 p.m. | | |
| January | 85·4 | 77·7 | 81· | 13·6 | 29·899 | 79 | 67 | 2·77 | 7 |
| February | 85·9 | 78· | 81·4 | 14·4 | 29·893 | 79 | 68 | 5·27 | 9 |
| March | 86·9 | 78·8 | 82·3 | 13·8 | 29·888 | 79 | 67 | 3·95 | 7 |
| April | 84·9 | 77·4 | 80·5 | 16·1 | 29·929 | 80 | 75 | 10·24 | 18 |
| May | 82·7 | 75·4 | 78·2 | 14·4 | 29·995 | 83 | 74 | 10·12 | 17 |
| June | 83·8 | 74·5 | 77·9 | 12·4 | 30·085 | 77 | 60 | 0·31 | 3 |
| July | 81·7 | 73·2 | 76·4 | 13·1 | 30·103 | 77 | 60 | 2·03 | 6 |
| August | 82·3 | 72·5 | 76·4 | 14·2 | 30·386 | 75 | 57 | 1·19 | 7 |
| September | 83·5 | 73·8 | 77·6 | 13·4 | 30·078 | 76 | 61 | 1·12 | 7 |
| October | 83·9 | 74·9 | 78·7 | 14·4 | 30·006 | 78 | 63 | 2·52 | 11 |
| November | 84·6 | 76·4 | 80·4 | 14·1 | 29·924 | 78 | 68 | 5·00 | 14 |
| December | 85·4 | 77·4 | 80·8 | 13·2 | 29·923 | 79 | 67 | 4·35 | 12 |
| | | | | | | Total | | 48·87 | 118 |

Mean temperature = 79·3°.
Highest temperature recorded = 91·2° in February 1882; lowest = 67·4° in September 1884.

The question of *temperature* being as important in its bearing on cultivation as that of rain-fall, the following information on this point will be useful. Dr. Robb gives the mean temperature of the five years of his observation as 80·3°, and the average yearly range from the highest maximum to the lowest minimum as 17·3°. In the *Kew Bulletin* for 1890 (p. 216), Sir John Kirk confirms Dr. Robb's observations by a valuable record for the year 1878, "taken in the open

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and shaded corridors of the Residency, unaffected by sun and sky radiation."

| | | |
|---|---|---|
| Highest reading of the year (February) | | 88·3° |
| Lowest reading of the year (July) | ... | 72·0° |
| Extreme range | ... | 16·3° |

For the five years 1880 to 1884, inclusive, it will be seen that Sir John's observations gave a mean temperature of 79·3°; the highest temperature recorded, 91·2°, being in February 1882, and the lowest, 67·4°, in September 1884. The hottest time of the year is from January to March, and the extreme months are April and September. Mr. Ravenstein states the daily range at Zanzibar in the former month at 7°, and in the latter 8·9°; the mean daily range for the year being 7·8°, and the annual range 5·8°. The mean daily range at Greenwich for the year is 10·6°, and the annual range 23·9°; the mean temperature being 49·5° as compared with 79·8° at Zanzibar.[1]

In this connection the following comparison of temperature, from *Haldane's Sub-Tropical Cultivation and Climates*, will be both interesting and suggestive—

| Station | Lat. | Jan. | Feb. | Mar. | Apl. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Year |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° |
| Kingston, Jamaica | 18° 1′ N. | 75·4 | 75·7 | 75·2 | 77·5 | 77·7 | 80·0 | 81·5 | 81·4 | 81·5 | 79·2 | 77·4 | 77·2 | 78·4 |
| Zanzibar | 5° 43′ S. | 82·9 | 82·9 | 83·5 | 81·5 | 80·0 | 78·6 | 77·2 | 77·4 | 77·1 | 79·4 | 80·9 | 82·2 | 80·3 |
| Bua, Fiji | 16° 38′ S. | 81·2 | 80·5 | 79·2 | 79·9 | 79·5 | 77·1 | 76·5 | 77·9 | 79·7 | 79·9 | 81·1 | 80·3 | 79·4 |

The town of Zanzibar is now so well known that I do not think any further description is necessary. I cannot, however, omit a reference to the excellent system by which water is conveyed to the town, from a natural spring situated at Chemchem, about 3 miles distant. The water is first brought from the spring—now carefully built over and protected—by a large covered drain, with open ventilating holes;

[1] *Report*, etc., quoted above. Mr. Ravenstein's figures for Zanzibar are stated to be based upon observations for Temperature, twelve years; Daily Range, ten years; Rain-fall, sixteen and five-twelfths years.



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then, nearer the town, where the fall in the ground necessitates it, iron pipes, about 1 foot in diameter, have been connected with the drain, each pipe being supported by a solid pillar of masonry at an average height of 4 to 5 feet. In the town itself the pipes are underground, and the water supply was, at the time of my visit, being largely extended to the various quarters.

When ready to leave Zanzibar for my tour in the island (March 19, 1892), I adopted the following route, which was carefully planned out to enable me to visit the more important parts—

*North*, from Zanzibar to Kokotoni; distance 21 miles; halting on the way at Chueni.

*South*, returning from Kokotoni by M'Do to Dunga; distance 5 hours; distance from M'Do 2½ hours.

*East*, to visit the barren portion east of Dunga.

*West*, Dunga to Zanzibar; distance 12 miles; visiting the valley of Bonde la Mzungu on the way.

This route took me over the most important portion of the cultivated area, with a brief visit to the barren and exposed side of the island.

The Sultan having promised to send me to Chueni in one of his carriages, I found, when ready to start about 4 p.m., a messenger from his Highness, who stated that the road to Chueni had broken in, and that it was impassable for a carriage. A horse was sent instead without saddle or bridle; under the circumstances I preferred to walk, Sir Lloyd Mathews accompanying me for some distance on my way to Chueni Palace, 7 miles off.

Two of the Sultan's orderlies were attached to my person during my tour through the island.

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## CHAPTER II

### CHUENI—KOKOTONI AND SURROUNDING COUNTRY

Luxuriant Verdure—Chueni Palace—Clove Plantations—Country round Chueni—Neglected Shambas—Kokotoni—Mr. Fraser's Experiments: Sugar-cane and Coco-nuts—A Charming View—Scarcity of Labour—Salim bin Hamisi and his Estates—Character of Kokotoni District.

I WAS much struck, after leaving Zanzibar town, with the extreme greenness of the vegetation everywhere, a great contrast to the burnt-up mainland I had just left. Even the rank grasses, with which several patches of uncultivated land were overgrown, shared the general luxuriant verdure. Coco-nut trees were numerous, some growing in clumps, but others more scattered; some of these latter being very thin and lanky, and tapering up to a great height. I especially noticed and admired the numerous large and luxuriant mango trees along my route. The chief cultivation in this district appeared to be cassava, but I also passed one or two clove shambas; the regularity of the lines of trees much impressed me.

The road to Chueni runs parallel to the sea, and I was not sorry to arrive, about 6.30 p.m., at the end of my first stage, for not having expected to walk, my enjoyment was spoiled by the discomfort of walking in thin canvas shoes over a bad and wet road. The palace of Chueni is situated on the other side of a river or backwater, which I crossed by a temporary wooden bridge. Some iron pillars lying on the beach were being painted, probably for use as supports to a new bridge. The palace is built right on the sea, the waves almost washing its base; it is a double-storied building with



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a large verandah running round the upper floor, and in appearance much resembles the palace at Zanzibar. The accommodation comprises two large interior rooms used for banquets, with tables down the centre, as well as small drawing and sitting-rooms opening out of the larger ones.

Ice, fruit, sherbet and lemonade, etc., were provided for me; but it was so late when I arrived that Ragi, the head-overseer, had given me up for that day, and had gone away. My porters and my cook had straggled dreadfully on the road, and at 9 p.m. there were still no signs of them or dinner, so I contented myself with bananas and bread.

Ragi came to see me next morning, and informed me that he had received strict orders from the Sultan to supply all my wants and to give me all the assistance and information I required. At about 8 a.m. I proceeded on my first visit to the clove plantation of Chueni, accompanied by Ragi. The plantation, the private property of the Sultan, is a very extensive one, and is situated on the direct road to Kokotoni and close to the sea. The estate possesses a steam sugar-crushing mill with permanent buildings, which are in good order. The comparatively small amount of sugar-cane now grown is crushed here. Beyond the mill is a flat country, with fields of sweet cassava on one side of the road, and the native variety on the other, with scattered coco-nut trees growing amongst it. After passing through some rice-fields, and occasional clove shambas, we continued along the direct Kokotoni road — through an extensive and closely-planted coco-nut plantation, the trees consequently very lanky in appearance — until we reached the Sultan's clove plantation. I was much struck with the extreme regularity of the rows of trees, which presented straight lines in every direction. They looked most vigorous and healthy, with few or no vacancies, and the ground was fairly clean. Coco-nut trees were planted at irregular intervals between the clove trees, which latter were seventeen years old. Along the roadside were some closely-planted *Areca* palms. Slave huts were scattered here and there among the clove trees, and were surrounded by small plots of cassava, sweet potatoes and clumps of bananas; there were also a few open spaces with small clumps of coco-nut

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trees. The soil had a grey to dark loam surface, with a subsoil of clay. There was a good deal of grass, and although, in comparison with others, it was well kept up, the plantation could not be described as clean.

I took the opportunity while staying at Chueni to examine the country to the north and north-west, as well as to the south, of the Sultan's plantation. In the former district there are no clove trees; the cultivation is all open, the soil being chiefly a light grey loam. There is much uncleared land, mostly overgrown with high, rank grass, and a good deal of "ilook"[1] amongst it. This grass is very bad, and difficult to eradicate out of the land, as it spreads rapidly from the roots. The country is low and undulating, with many hollows and valleys containing water.

Both varieties of cassava[2] are cultivated, the tubers of the *sweet* variety being boiled, and those of the *bitter* kind dried on frames for a week, and then ground and pounded into flour. It constitutes the chief cultivation. Rice and sugar-cane are grown in the hollows and valleys, and the appearance of the sugar-cane was, in places, very fine; both it and rice could be much more largely cultivated, as the water supply appears to be abundant.

Coco-nut trees are very plentiful, and are scattered all over the country, intermixed with numerous mango trees, some of which are really magnificent. Regular plantations of coco-nuts are rare; I saw only one, close to the Chueni clove estate. They are generally planted in clumps, being thickest in the vicinity of houses; along my route scattered trees were numerous, and had very lanky stems, most probably owing to the land surrounding them being uncultivated. Small clumps and plantations of bananas, orange, and other fruit trees are frequent. Around the slave villages and other native houses there are generally small gardens, in which are grown bananas, pumpkins, sweet potatoes, peas (*Cajanus indicus*), etc.

[1] *Imperata Kœnigii*; there are two varieties of this grass, one a broad-bladed kind, the other thin and spiral.

[2] The bitter cassava (*Manihot utilissima*) and the sweet cassava (*Manihot aipi*).

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To the European eye the want of system and care is manifest, but the luxuriant appearance of the vegetation everywhere testifies to the great fertility of the country. The soil varies in character, being chiefly black to grey near the shore, in other places, very sandy loam; further inland a dark chocolate, often two feet in depth, alternating with a lighter loam. Much of it is mixed up with fibrous grass roots, whilst in the valleys and hollows it is a rich stiff black. The subsoil is clay, with a substratum of coral.

No cultivation is carried on in the large shambas except hoeing and weeding, and its extent and character may be judged by the fact that only two implements are used—one for the clove plantations called "insaa," and a small light hoe for all other field operations.

The country to the north-west of Chueni is very undulating, hollows alternating with gently rising ridges. Much of the land is abandoned, and coco-nut cultivation is very scattered, no regular order in planting being adopted, so that the trees appear to be indiscriminately dispersed all over the country. Copra is exported, and coir manufactured in a rude manner by Comoro people only. Coco-nut trees seen in many places appear robust and healthy, and the average yield is from 100 to 120 nuts; but no particular care seems to be taken of the trees—the ground being only cleared in places beneath them, at irregular periods, for growing ground produce, chiefly cassava; such was the case even with the largest plantations I had yet seen. Amongst other products of this district may be mentioned "Uwanga," a species of arrow-root, and "Mbono," a Cucurbit (*Telfairia occidentalis*), yielding oil from the seeds, which are also roasted and eaten: its leaves are used to stop the bleeding of cuts and wounds. Bazi[1] leaves mixed with a little lime are also used for the same purpose. A good deal of rice and sugar-cane is cultivated in the hollows, the latter being crushed in the Sultan's mill at Chueni.

The country to the south of Chueni is rich and well-populated, cloves being principally cultivated. There is a good deal of uncleared land, and "ilook" abounds. The chief ground cultivation is cassava, with occasional fields of

[1] *Cajanus indicus.*

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rice and maize. I noticed luxuriant fields of sugar-cane on both sides of the road, and they were erecting a small sugar-mill on the property of an Arab named Ali bin Issa, whose father, I was informed, formerly owned 1900 slaves, and sixteen plantations. The country all round this estate is densely populated, and groups of houses are frequent, with coco-nut and mango trees scattered about everywhere. Close by, an English firm was erecting a manufactory for extracting coco-nut oil, coir and aloe fibre, the machinery of which was intended to be worked by a 12-horse-power steam engine.

Some of the clove plantations that I passed through here were very large. Two extensive plantations belonging to the Sultan may be particularly referred to. That of "Kidichi," one of the largest on the island, is a fine property, the trees extending to a great distance in regular unbroken lines. They were all mature and vigorous, and the ground was very clean, though the "ilook" grass was noticeable here and there. The soil is a bright red clay. "Kongoni" is another plantation belonging to the Sultan (or his family), but here clove cultivation was combined with that of coco-nut, bananas, and ground produce. The lay of the land was flat, with the exception of one or two low hills.

Speaking generally, I would lay stress on the neglected condition of the cultivated land. For instance, in a fairly large plantation of coco-nuts which I passed through, the ground beneath the trees was thickly overgrown with dense bush and grass, and wherever, through fault in the soil, clove cultivation is not carried on, neglect is at once apparent; I passed over a fairly large plain of light grey, sandy soil (declared to be unfavourable to the clove), so, with the exception of a little cassava and some scattered mangoes, the ground was entirely neglected.

The soil varies from grey loam to red, and may be described as bright red, with a darker-coloured chocolate, mixed with disintegrated coral. The subsoil is clay. I examined the slope of a low hill where the soil was washed away to a depth of 5 feet by heavy rains: it consisted of deep red clayey loam. The soil of the Kidichi plantation was also of a deep

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red loam with sandstone substrata, often very close to the surface; it is very friable, porous, and easily broken.

At 7.30 a.m. on March 22 I left Chueni Palace for Kokotoni coco-nut plantation, about 14 miles distant, being provided by the Sultan with a donkey, and letters to the Government people at Kokotoni. The land between Chueni and Kokotoni is flat. Cultivation and soil vary so greatly, that a summary of my notes will best convey a description of the chief characteristics of this portion of the island.

I may state generally that the soil in the course of this journey consisted of grey or black loam, and the cultivation of coco-nuts, betel-nut palms, cloves, cassava and mango trees. The cassava and sweet potatoes were cultivated in raised beds, and in open fields, but without any apparent method; further on the cloves became less numerous and less luxuriant, the average height being 20 to 25 feet, and later on they were smaller still, and of a marked yellow colour. The soil was too damp and low for them; in fact, in one place rice was actually growing beneath the trees, and the appearance of the clove trees generally was unsatisfactory, great neglect in cultivation being evident. After crossing a small river, named Mzinga Mzinga, and entering upon a tract of very flat land, clove cultivation ceased.

This part of the country was nearly all grass-grown and uncultivated. Here and there was a little cassava, and a few patches of rice, coco-nuts, and isolated mango trees. The coco-nut trees were extremely scattered, and appeared to be utterly neglected, growing as best they could on the flat plain, which was a tangle of grass and bush; I observed many yellow leaves—a sure sign of distress—as well as many dead trees. It was no fault of the soil, which here was of a more sandy nature, the bush and grass being luxuriant enough. In the middle of the plain I observed a few wild oil-palm trees,[1] termed in Swahili "Inchikichi." Abreast of Dongi, a low hill to the north-west thickly covered with cloves and coco-nut trees, the cultivation improves a little, and I soon passed a fine plantation of young coco-nut trees,

[1] Identified, I believe, by Sir John Kirk with the oil-palm (*Elæis guineensis*) found in West Central Africa.

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where the ground beneath was quite uncleared. Then I crossed a second river, flowing at right angles to the path, called Monakombo; the soil of the banks is a dark grey, stiff loam, and its further side presents much the same appearance as that of the Mzinga. I then traversed a low-lying plain, with a few isolated patches of rice growing in swampy hollows. This plain appears to be well adapted for either rice or sugar-cane cultivation, and the paucity of the former is probably owing to the want of adequate labour. Close to Dongi Hill the plain opens out into a fine fertile valley, and cultivation again becomes apparent. Close to Kokotoni plantation, lying right ahead, I passed through a good deal of very fine young rice, water being abundant. The grey soil and flat land struck me as well suited for the growth of ground-nuts.

In the Kokotoni plantation I crossed a small river named Kipanga, flowing between banks of stiff grey loam. No stones are visible, and the banks are in places 7 to 8 feet deep, showing the volume of water brought down in the wet season.

A brief description of this plantation will be instructive, as it is, so far, the only attempt at cultivation on the European system. The present owner is an Indian merchant (Banian), whose father obtained it by foreclosing the mortgage of the original Arab proprietor. A Mr. Fraser leased the estate about twenty-five years ago, and greatly extended it by the purchase of seven or eight other plantations, making it eventually the largest property on the island; he had it twelve years, and during the first six years carried on sugar-planting extensively and profitably, erecting a large, substantial sugar-factory and importing valuable machinery, worked by steam-power, from England. This industry was discontinued, for personal reasons, and Mr. Fraser next turned his attention to coco-nut cultivation. Originally there were but 5000 of these trees growing on the estate, but he planted largely, and coco-nut oil mills were erected; shortly after Mr. Fraser's departure an enumeration showed the enormous number of 80,000 coco-nut trees as growing on the estate, to which 1400 clove trees, 65 orange trees, 240 mango trees, 28 jack trees, and 85 areca palms were subsequently added. There were 750 slaves on

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the property when Mr. Fraser took it, and besides these (who, of course, became *ipso facto* free), he employed 500 additional labourers daily, thus making the considerable total of 1250 labourers on the estate. The wages at that time were only from 8 to 10 pice per day.

From the low hill on which the residence is built, one commands an extensive view over this large and once valuable property, admirably situated in the low fertile plain bordering the sea. The thousands of coco-nut trees stretching away on every side, with here and there detached fields of luxuriant rice, and out at sea the island of Tumbattu, lying nearly opposite, present a charming tropical landscape. I was informed that there were over 1000 people living on Tumbattu, and that the island had a bad name as the residence of wizards. Beyond Tumbattu there is a smaller island called Mwana, where several Banians reside, and a market is held there every day, at which fish, shark's flesh, cloths, etc., are sold.

At present the estate of Kokotoni is being worked as cheaply as possible under the charge of a native overseer, and, with the little care and attention now paid to it, it is fast losing its original value. The factory is now useless, and its once valuable machinery ruined by rust and disuse, whilst the plantation itself, which I traversed from end to end, presents everywhere the same picture of utter neglect; the regular lines of coco-nut trees—said to be about twenty years old, and planted at distances of 32, 35, and 40 feet apart—are so choked up with grass and bush that many nuts are lost by falling into this dense undergrowth, and I noticed some self-sown plants struggling up as best they could. Many vacancies are noticeable, and the trees generally have a decidedly red and unhealthy look, the yield per tree being in such cases only from 5 to 50 nuts a year. Good cart-roads were originally cut by Mr. Fraser, who appears to have shown great enterprise, but these are quite overgrown and neglected, only one cart and two bullocks being now in use to collect the nuts. The soil, which varies from a stiff black to a lighter grey loam in more favourable sites, is all fairly rich. I was interested in the healthy and vigorous appearance of the coco-nut trees on the margin of the river. Their

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luxuriance was accounted for by their roots having access to the tidal salt water.

In Kokotoni again are seen the results of so many years' surface cultivation, the earth being completely matted with fibrous grass; the surface hoeings, where the "ilook" grass is found, far from destroying that noxious weed, encourage its growth. This matted state of the soil is a great check to cultivation, and is especially harmful to the roots of the coco-nut.

No regular plantations of coco-nuts are made by the Swahili, who say that if their shambas were planted with them they would not be able to cultivate other products; many of them own only a comparatively small plot of land, on which are generally found all the products usually cultivated by that class of people; viz. maize, Guinea corn, arrowroot, cassava, sweet potatoes, bazi, yams, pumpkins, coco-nuts, mangoes and other fruit trees. I may mention that the reason why Arabs plant coco-nut trees here and there at irregular intervals in a clove plantation appears to be either unknown to themselves or forgotten; they must have copied the custom from the French in Mauritius and Bourbon, who originally derived it from the Dutch, these last having discovered that the neighbourhood of the coco-nut palm is favourable to the clove, though the coco-nut trees growing amongst cloves are generally lanky and yield poorly. The nuts are collected by the Swahili in a hap-hazard way and placed in heaps along the roadside; many are lost through the absence of any regular system of gathering. The average yield of the trees is from 100 to 200 nuts a year. I noticed the very small size of many of the nuts, caused by the neglected and overgrown state of the trees. Nuts are gathered for the *copra* alone, but owing to the distance of this place from Zanzibar and the difficulty of transport, a good many appear to be shipped whole direct to Bombay, and a dhow was being loaded here at the time of my visit. The average price was from 20 to 25 dollars[1] per thousand.

[1] The "dollar" is the commercial unit of account on the east coast, and the currency is the same as that of India. The fixed value of the "dollar" is 2⅛ rupees, so that it varies with the rate of exchange.

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Husks on the Kokotoni plantation are not made use of in any way, but are left to rot in heaps, on account of the small demand and difficulty of transport. Baskets of them sell in Zanzibar for from 6 to 8 pice, the purchasers being the Comoro people. Beaten coir fibre is sold in Bombay at from 4 to 5 rupees per frasila (35 lbs.). No toddy is collected from the trees here—labour not being available.

The small amount of labour now required on the estate is supplied by freed slaves, of whom about thirty reside on the property, and are kept permanently as watchmen to guard against theft—extra labour for gathering nuts, etc., being obtained as required, at the daily wage of 16 pice (4 annas).[1] Hired labour in this part of the island is, however, very scarce and difficult to obtain. Probably more labour could be found if the owner were not, on account of former losses, averse to spending more money on the place; the estate is an instance out of several, of the results of attempting extended cultivation without a reliable labour supply. The labour question will be discussed in detail in a subsequent chapter, and it may suffice to say here that imported labour seems to be the only remedy for the present state of things, and that there is ample field for its productive and profitable employment, as shown by the experiment carried out by Mr. Fraser. The whole of the valley below the house, now thickly planted with coco-nut trees, interspersed with some rice-fields, was in his time under sugar; and I have pointed out the advantage offered by the flat country between Kokotoni and Chueni for the cultivation of rice and ground-nuts, *labour alone* being required to develop these and other remunerative agricultural industries.

The north side of the hill on which the house at Kokotoni stands, slopes gradually down, and contains some fine clove trees mixed with mangoes, and cassava shrubs.

On the third day of my visit, I went, accompanied by the overseer, down the hill towards Dungi. The soil I observed to

[1] This was the average rate for hired labour ruling at the time of my visit to Zanzibar.

The rates for coaling ships at Zanzibar were—for men, 40 pice; for women, 25 pice per day.

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vary from a deep red clay to chocolate loam. We passed some most luxuriant clove trees growing neglected in the bush and grass, from 30 to 40 feet in height, and ten years old; and also some very fine bananas, 18 to 20 feet high and of a girth of 3½ to 4 feet a foot above the ground, growing in clumps round the houses lower down the hill. This was the first banana cultivation that I had seen, surrounding a small village of freed slaves (Wahadinu people, the original inhabitants of the island already referred to), and interspersed with mango and coco-nut trees. The custom is to give each slave, when freed, a small plot of land attached to his house, in which he grows native produce for domestic consumption.

I next passed through a large clove plantation, the property of an Arab named Rashid bin Kalfan; it was the very cleanest shamba I had yet seen. Roughly speaking, the rows were 27 feet apart and 80 feet long.

Beyond this shamba was open country, with patches of "ilook" grass, and further on a good deal of uncleared undulating land, the soil grey to black loam. After passing other shambas I noticed the clove trees simply scattered about, not regularly planted, and mingled with cassava. The trees here were all young, about four years old and 10 to 15 feet high, of very light foliage, and certainly not so luxuriant as those growing in red or dark chocolate soil.

I passed by a large, unfinished stone house, belonging to the late Suliman bin Kalfan: there is a singular Arab custom that if an Arab dies leaving a building unfinished, it remains just as the dead man left it. After passing this place, you come to a ridge called Kiongene, with water in the valley below, where sugar-cane is grown.

Proceeding in a north-easterly direction, I found the soil varied remarkably, being now black to grey loam, and further on, improving to darker black loam. I noticed, in proceeding through the clove plantation of Salim bin Hamisi (the Cadi of the district, who had visited me the day before at Kokotoni), a very sudden and marked improvement in the appearance and height of the clove trees, and on examining the ground, found it consisted of a surface depth of 6 inches of black soil mixed with sand, and a subsoil of stiff, black,

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rich clay. The trees were very luxuriant and vigorous, with healthy deep green foliage. Their age was six to seven years and average height 25 feet—the best I had previously seen being only 20 feet high at the same age. I examined a nursery of young clove plants, three years old, and found the height of one pulled up to be 3½ feet, above the collar, with a tap-root 18 inches long; this plant of course was too big for planting—the usual size for that is from 6 inches to a foot high.

Continuing my way through the clove plantation and passing a small watercourse, I arrived at another fine plantation of clove trees, in which is situated the house of the owner, Salim bin Hamisi. I called on this gentleman, and was most hospitably welcomed, and entertained with green coco-nuts and numerous Arab delicacies and sweets. The trees on the further side of the watercourse were six to seven years old, whilst on this side they were sixteen years, and looked healthy and well cared for. The soil is excellent, varying from dark red chocolate to brown loam. Salim bin Hamisi asked me to inspect another estate of his close by, but time did not permit. There were two Indian shops and some houses, situated on the borders of the Cadi's plantation. Leaving this I passed through much uncleared land, and the clove trees, after gradually diminishing in numbers, at last entirely ceased, the shamba owners whom I questioned being unanimous in their remarks on the great trouble and care required in their cultivation. I here also noticed a sudden change in the character of the soil—from stiff brown loam to red, and in places yellow clay, with coral outcrop, and further on again, black to grey sandy loam. The landscape varied between groups of houses, rows of bananas and orange trees, and rice-fields. From being low or level the country now became more undulating, with much "ilook" grass. The cultivation consisted of clumps of coco-nut and mango trees, and on the open plain further on, rice-fields; the appearance of soil and produce being very inferior.

Having now examined a considerable area to the south, south-east, and north of Kokotoni, and described, in fact, almost a complete circle round it, I will summarize the results

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of my observations. The character of the land is, at first, gently undulating, with scattered low hollows; as one proceeds it becomes more undulating, with well-defined, long low ridges and intervening hollows; then very level flat land, and then again occasional fertile valleys. The water supply is abundant, water being generally found in the hollows and valleys. I passed two streams, one with deep banks made by the rush of water in the rainy season.

The soil varies very much. That of the undulating country was formed of—

1. A deep red clay, in places varying from a rich black to a chocolate loam;
2. Grey to black loam, clayey subsoil;
3. Grey to black loam, sandy.

That of the ridges was red to chocolate loam on the slope; higher up, stiff, black clayey loam, with scattered small coral stones. In the finest and largest clove plantation the surface, for a depth of 6 inches, was black loamy sand; the subsoil, stiff black clay. In the watery hollows the surface soil was black loam, but where this was washed away and the subsoil exposed, yellow clay. The flat land was a rich dark red to deeper chocolate, the water in puddles being coloured dark red to yellow; and again, very rich, stiff brown to chocolate, in some places more inclined to brown, and in others a clayey red or yellow, with coral outcrop.

In the low-level valley its character was black to grey sandy loam, and in the river bed clayey stiff loam, with coral outcrop. Certain flat barren areas, as already mentioned, are called "Waanda," and the following brief extract from my notes will illustrate their characteristics—"Beyond this, open plain with rice-fields (dry). Soil sandy grey loam, very sandy and inferior. The appearance of both the rice and the bush and grass on uncleared land very poor and straggling. Coco-nut trees have yellow foliage and unhealthy appearance, a few mango trees fine. This plain is fairly extensive. Coco-nut trees all round are thin and lanky, the soil of land cleared for rice cultivation very white to greyish-white on surface, from sandy nature of soil."

Cultivation is fairly extensive, the chief ground produce

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being cassava. In the hollows there are generally sugar-cane patches, and rice, but the principal produce is certainly cloves, cultivated either in regular plantations, some fairly extensive, or scattered about amongst other produce. I passed through one or two young clove plantations, irregularly planted, rice and cassava being grown underneath. The age of the clove trees about here varies between four, six, seven, and ten years, the eldest not exceeding sixteen years of age. Generally speaking their appearance is vigorous and healthy. Young trees usually have a marked yellowish appearance in the foliage, which disappears as they grow older. I saw some ten-year-old trees fully 30 to 35 feet, and in some cases quite 40 feet high, but this is exceptional. Other trees six to seven years old averaged 25 feet in height, and appeared most luxuriant and vigorous, their foliage being of a deep healthy green, while scattered about were many younger trees, probably three to four years old. There is certainly a marked difference between those growing in sandy loam and those in a more consistent soil; clay is undoubtedly required for the clove tree, and wherever I noticed any sudden and marked improvement in the appearance of the trees, the soil was almost certain to contain clay. A certain number of coco-nut trees are to be seen in the flat district, but they are not numerous, and are often much neglected; these trees, as I have remarked, when found in clove plantations are thin and lanky. Mango trees are scattered everywhere, some being exceptionally fine. Orange and other fruit trees are frequent. Bananas are much cultivated, and I noticed some particularly fine clumps. Indeed the luxuriance of the vegetation in this part of the island much impressed me, though unfortunately "ilook" is very prevalent.

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## CHAPTER III

### KOKOTONI TO DUNGA

Continuous Clove Plantations—Arab Residences—Streams and Ridges—M'Do—A Neglected Property—Mwera Valley—M'Zingam Plain—Dunga.

AT 6 a.m. on March 25, I left Kokotoni, marching southwards to M'Do, five hours distant, where there is a shamba belonging to the Sultan. This is certainly the richest and most fertile portion of the island. The journey took me five hours exactly, marching at the rate of three miles an hour, the total distance being fifteen miles.

I think that a fairly accurate description of this part of the country can be conveyed by a summary of its characteristics as noted during my journey.

From six o'clock, when I started, to 8.30 a.m., my direction was due south, and the lay of the land undulating, with low ridges. The soil on the ridges was of a bright red to chocolate colour; on the slope, a stiff clay loam; in the hollows, loamy black, with coral outcrop and traces of sandstone substrata. After passing some fine orange trees, and houses with cassava shambas, I entered some luxuriant clove plantations, the average height of the trees being from 30 to 35 feet, and the circumference of the stems 1 to 1½ feet. The land was unusually clean, and the trees most regularly planted, some forming quite a fine avenue along the road. As usual, there was a good deal of uncleared land, but the country as I advanced was well-populated, with numerous houses and considerable ground cultivation. The soil was a rich loamy black, very fibrous however from grass roots, and I noticed this particularly in freshly-hoed land. Coco-nuts



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and mangoes were frequently planted amongst the clove trees, and areca-nut palms along the roadside. The luxuriant appearance of the country continued, and as I proceeded, the land became covered with almost continuous clove plantations, interspersed with cassava patches around the houses; with some fine jack trees (*Artocarpus integrifolia*) growing here and there.

Dungi clove plantation, which I now passed through, and which belonged to the Sultan (or the Goverment), merits special mention, as one of the finest I had ever seen. It is clean and well weeded, and the trees are most luxuriant, with a deep green foliage in many places quite shading the ground. The clove trees planted along the roadside make quite an imposing avenue. The planting distance is about 20 to 30 feet; in fact the lines appear closer than they really are, owing to the very luxuriant and robust condition of the trees, the branches of the opposite rows often intermingling. The soil is a deep red to darker chocolate clayey loam, and the land slopes gently towards the east.

After leaving Dungi I emerged on open country, chiefly uncleared, with the exception of some scattered cassava fields, clumps of mango and coco-nut trees, some of the latter poor and unhealthy in appearance; then through more clove plantations which, from their uncleared and grass-grown condition, and general aspect, presented a great contrast to the estate I had just left.

In this part of the country, where no regular clove plantations exist, the land is a mixture of scattered cloves, young and old, with numerous coco-nut, mango, and other fruit trees, and in some places these appear to be as numerous as cloves; with here and there the usual patches of cassava.

After about two and a half hours' walking (say 7½ miles from Kokotoni), I passed occasional large and substantial stone-built Arab residences, one being shaded by a particularly fine clump of jack trees; the country here is very fertile. In one large plantation that I passed, I observed some fine clove trees. I measured the stem of one, which was 6 feet in circumference at a height of 6 inches from the ground, but the average girth was from 1 to 4 feet; the trees had often

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RESTING AT THE WELL.

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as many as four branching stems. On leaving this I crossed a small watercourse (bridged) and ascended a slight ridge on the other side. The soil, on the slope, was brown, with much coral outcrop; and on top of the ridge, a dark red to chocolate. Then came open country, with rice cultivation on the ridge side, which slopes gently down towards the west, and opens out into a large plain thickly covered with groves of coco-nut trees; these, with alternate green rice-fields, extend as far as the eye can see, a charming picture of a rich and fertile plain.

Proceeding along the top of the ridge, I found that the soil varied from brown or chocolate loam to red and yellow clay; and I noticed that the clove trees, both on the road-side and in the plantations, presented a change coincident with that of the soil, becoming larger in the more clayey parts of the country. Besides cloves, orange and other fruit trees, there were numerous fields of maize, rice, and cassava, several gardens surrounding houses, thick clumps of bananas and coco-nuts, areca palms, sugar-cane patches, and many mangoes. The fertile appearance of this part of the country is, however, much marred by large areas of uncleared land; more particularly an extensive low-lying plain, which I crossed at 9.15 a.m., and which, with the exception of a few scattered fields of cassava and some patches of rice in a swampy hollow in the centre, was totally uncultivated and thickly overgrown with tall grass, 3 to 4 feet high.

Having crossed a third small river and another low ridge, I came upon scattered houses, with fine clumps of bananas and numerous coco-nut trees, whilst jack trees became more plentiful, taking the place of the disappearing mangoes. Changes of soil were frequent, generally from red and darker chocolate to a sandy grey loam. At 10 a.m. I came to the end of the ridge and crossed two more streams, which, like most of these rivers, had a thick growth of large-leaved aquatic plants on their banks; here I again passed through some very fine, extensive clove plantations, and noticed many young plants. There was occasional open cultivation, chiefly cassava; and the soil for the remainder of my journey to M'Do was of the following varieties—

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1. Black to grey stiff loam, clayey.
2. Stiff black (sandy on surface) with red to yellow subsoil.
3. Dark yellow, very consistent, mixed with sandy loam.

Excepting one or two small uncultivated plains, the country up to M'Do presented a rich and luxuriant aspect; areca palms were here more frequent, but what struck me more particularly was the large area under coco-nut cultivation, indeed the number of these trees growing in this central part of the island must be very large. For the last half-hour before reaching M'Do, I travelled through continuous clove plantations, extending on both sides as far as the eye could see, with many houses nestling amongst the trees, some surrounded with deep green, luxuriant bananas—a lovely scene! In some plantations the soil was simply pure yellow clay, and apparently unsuited to the growth of any other product but cloves. The land was flat, with a few gentle ridges.

I arrived at 11 a.m. at M'Do, which belongs to the Sultan, and camped under a fine mango tree, the seed of which was imported from Réunion by the Sultan Seyyid Barghash.

This estate, once a fairly large sugar plantation and extremely well situated, dates from the reign of Barghash, who certainly showed much energy in endeavouring to develop the resources of the island, agriculturally and commercially. Since his death, things have been allowed to go to ruin. The land, originally under sugar-cane, is now either abandoned or sparsely cultivated by slaves. The factory is greatly out of repair. The motive-power was water, the supply of which was obtained from an adjacent well by a hand-worked pump and conducted by iron pipes to the sugar-mill. There was at one time a force of fully two hundred to two hundred and fifty slaves on this plantation, but at the time of my visit the numbers had dwindled down to barely forty.

A fine broad road, planted with cloves, traverses the property from east to west. Towards the west there is a slight ridge, but the land is elsewhere flat. Amongst the clove trees the soil is chocolate to red loam; in the old sugar land, black to grey loam; the subsoil, clay.

In the afternoon I had a conversation with the head-overseer, a fine old Arab named Mohamed-bin-Saif Drumiki.

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He had been in charge here for over twenty years, and furnished me with much valuable information concerning the agricultural customs and cultivation on the island. Mohamed told me that most of the clove plantations date from the great hurricane of 1872, when so many were destroyed. He remembered trees before the hurricane which yielded five frasila, or 175 lbs., of cloves each. He also stated that the average length of life of the clove tree in Zanzibar was from sixty to seventy years; some of the trees growing before the hurricane were still alive.

I left M'Do on March 26 at 7 a.m., proceeding east and south-east, over a flat country, which presented the usual features of numerous houses surrounded by banana clumps, bazi, and scattered mango trees. The road then led me through the clove plantations of the Sultan Seyyid Ali—brother of the late Sultan Khalifa, who was also a brother of his predecessor, Barghash; four sons of the Sultan Said, who died in 1856, having successively occupied the Zanzibar throne since that date. The soil was red to chocolate, and the land was very flat. The path now inclined a little to the west, and then to the south, leading into a low valley, with much "ilook" grass, and a ridge running to the west. We then followed a central ridge, and the opposite low hill was densely covered with cloves, bananas, coco-nuts, etc. Cloves continued on both sides, and we passed through a fine, wide avenue of clove trees, and by the Sultan's plantation of "Kignamanzi," an extensive property with a large stone house, the walls of which were painted in a black and white check. The circumference of the tree-stems here averaged from 12 to 18 inches, that of the younger trees 6 inches. Proceeding south-east we passed through thick banana, coco-nut, and mango clumps, and numerous houses surrounded by fruit trees. The country became more open and very flat, with a great deal of uncleared land.

Proceeding eastward I next passed through a low, flat valley, with a good deal of banana cultivation on both sides of a fine, wide, but neglected road. The path then crossed the Mwera river, which flows rapidly through the valley of that name; a new stone bridge was being built over it. On the

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opposite side the path led over a low hill, the soil near the river being very stiff clay, and half-way up stiff chocolate to yellow loam. From the hill-top a fine view was obtained over the lately traversed country, which from this distance seemed a dense grove of coco-nuts and bananas. On this ridge is situated the fine and extensive plantation of "Kisimbani," the property of the Sultan. The trees, many of them survivors of the hurricane of 1872, presented a really magnificent appearance, being fully 30 to 40 feet high, and completely shading the ground. The soil is a deep red loam. We then struck to the south, having luxuriant clove trees all round us, the circumference of many of the stems being quite 4 feet. "Ilook" grass was very prevalent here; and a little further on, the trees were not in any way so fine or so vigorous, a fact undoubtedly due to the "ilook." On both sides rose low, undulating ridges, covered as far as the eye could see with clove trees.

Descending the ridge, the soil was a stiff deep red to chocolate. In front rose another low hill, and below lay a rich, fertile valley, named Machone, also the property of the Sultan; the small stream flowing through it was bordered on both sides with mixed clumps of cloves and coco-nut trees, and fields of luxuriant rice and sugar-cane. This valley appeared to me to be well adapted for rice cultivation. On the top of the opposite ridge an extensive and fairly clean plantation occupied both sides of the road. It belonged to Benoni-bin-Seyyid Sultan, the Sultan's brother, and consisted of mixed cultivation—cloves, sugar-cane, bananas, coco-nuts, mango, orange, and other fruit trees. The clove trees were mostly young, and the fields of sugar-cane looked promising. There was a small sugar factory here, worked by water-power obtained from a well. The soil was a deep loam mixed with white sandstone; and in the sugar-cane fields a rich, stiff, black loam.

After passing through more fields of sugar-cane, some abandoned, my route struck south through a flat, rich country, which, excepting the usual areas of uncleared land, was fairly well cultivated. I especially noticed some extensive and thickly-planted groves of coco-nuts. Houses were

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fairly numerous, whilst in the distance were low hills planted with clove trees; the soil here was a rich, stiff, chocolate loam. The road was very winding, but this afforded me opportunities of seeing a great deal of the country. Emerging next upon a large uncleared plain called M'Zingam, I was struck by its singular appearance; there was a total absence of trees, only here and there scattered clumps of low bush, and the whole of the ground covered with grass and bracken-fern; the exceptional feature was the extraordinary outcrop of coral rock everywhere. It struck me that by regular burning, and turning cattle on immediately the grass sprang up, this plain might be utilized as grazing land. After this, an area of cultivation was again entered, whilst ahead appeared the ridge called Dunga, distant from M'Do about $7\frac{1}{2}$ to 8 miles by the road, but much less as the crow flies.

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## CHAPTER IV

### THE WAHADINU COUNTRY—RETURN TO ZANZIBAR

Handsome Stone House—Dunga Hill—Visit to the Wahadinu Country—Coral-strewn Plains—Return Westward—Cassava Fields—An Underground Stream—Zanzibar again—Sir John Kirk's Garden at Mbweni.

DUNGA plantation possesses a large and handsome stone house of two stories, much out of repair, but, at the time of my visit, undergoing restoration. The property belonged to the late Sultan's secretary, Mohamed-bin-Saif. A fine broad avenue of clove trees leads up to the house, where I was received with much courtesy, and took up my quarters in a large up-stairs room. Curious old carved wooden bedsteads occupied the two ends of my room, the floor of which was covered with matting and a carpet. The windows were of stained glass, of all colours, the lower half protected by wrought-iron gratings, and the upper half by shutters; in the centre of the building there was a large open space or inner courtyard, and stairs led up to the flat roof, which commanded an extensive view over the surrounding country. The walls of the house were 3 feet thick, and the outlet of the stairs on the roof was covered with a small thatched porch.

The appearance of the country here is remarkable. Dunga may be described as a low, flat hill, the low-lying land on both sides consisting of the same extraordinarily thick outcrop of coral rock, with thick bush and open grass spaces. Dunga plantation covers the greater extent of the hill and consists of mixed cultivation; I especially noticed some very large clove trees, one of which, on measurement, proved to be 5½ feet in circumference at the base, and



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was stated to be between sixty and seventy years old. The soil is a grey loam, alternating with richer chocolate, and the water supply, derived from wells, appeared to be abundant. Of cassava, the cultivation is confined to the sweet, white-stemmed variety, as the after-preparation of this is the most simple. Both varieties, however, will sell at the same price, and the cultivation of this product, as well as of chillies (*Capsicum annuum* and *Capsicum frutescens*), is carried on by slaves in the small patches around their houses. I was told at Kokotoni that it was the custom to allow people to squat or settle on ground where cloves are cultivated, with permission to cultivate cloves for their own use, on condition of picking the proprietor's cloves when they are ripe. Such a custom illustrates the prevailing lack of labour; and on my inquiring of the head-overseer of the Dunga estate the reason for so much uncleared land being found on the property, he informed me that it was solely due to want of slaves, of which there were only sixty, and that double the number were required to keep the estate in anything like proper order. I would call especial attention to this circumstance, as this property may be taken as a typical example, the proprietor being one of the most notable Arabs of the island. I may remark here that the arrangement of the clove nursery at Dunga appeared somewhat ingenious, the stems of growing cassava being utilized as supports of the top framework of sticks, which, covered with coco-nut matting, shade the clove seedlings from the sun.

At 7 a.m. on March 27, I left Dunga, accompanied by the overseer, to inspect the barren country to the eastward, occupied by the Wahadinu, who, as I have already remarked, are the aboriginal race of Zanzibar Island, and are noted for witchcraft and sorcery. On reaching the valley, the coral outcrop begins at once, and the sudden cessation of cultivation is very striking. In a hollow close by I visited a small chilli plantation among the coral outcrop, which was everywhere black-coloured. The area of this shamba was about a quarter of an acre, and it was surrounded by a low coral-stone wall to keep out the wild pigs, which are very numerous. The chilli plants were from 1½ to 2 feet high. There were a few lanky coco-nut trees

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about, as well as zimberao trees (*Eugenia malaccensis*); the latter yield a fruit something like a plum, dark red in colour, with a sweet acid taste. The soil was very black and fibrous.

Leaving the valley, I proceeded south, across an uncultivated plain, covered with grass and bush, the outcrop of coral increasing as I went on. After proceeding due east for about two miles, we turned off to the north-east, the bush becoming thicker, and in some places 8 feet high. Huge blocks of coral lay across the path, and the soil had in places the appearance of gravel, from the numerous minute pieces of coral-stone scattered through it. The natives use specially-made coir sandals for traversing this barren coral country.

At 8.30 a.m. I came upon another small chilli plantation belonging to the Wahadinu people; the ground was so covered with a jagged coral outcrop bleached white by the sun—in the bush it is generally black, or dark-coloured—that the earth could not be seen. This shamba had an area of about 3 acres, the plants being from 3 to 4 feet high, bushy and luxuriant, and appearing to thrive well in the soil. Tobacco with very small leaves and pinkish-white flowers seemed as much grown as the pepper plant; pumpkins and tomatoes also flourished. This part of the island consists of a succession of undulating ridges and valleys, the summits of the hills being generally flat. The sterile coral plain lying to the east of Dunga is called "Waanda"; beyond it lies another low hill, called "Waanda Kitowoni." As I proceeded, cultivation re-appeared, with clumps of coco-nuts, scattered mangoes, and fields of rice and maize, and very fine and luxuriant fields of chillies growing round the houses of a Wahadinu village. The capsicums grown on this land yield the large red and yellow pods sold in the town of Zanzibar, and are not so pungent as the small "bird's-eye" chillies grown in the "Waanda."

Proceeding down the centre of the ridge, I passed a good many houses surrounded by bananas, mangoes, coco-nuts and jack trees, but the cultivated area, chiefly chillies, was comparatively small and gradually decreased, the outcrop of coral becoming more frequent. I was much interested by the sight of a huge coral rock, rising sheer out of the path, fully 90

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or 100 feet high, and of great circumference, called locally "Limani." Looking southwards from this rock, the country appears all grass and bush, with a thick coral outcrop, the soil being a friable dark-coloured loam, much mixed with coral. "Limani" rock was the limit of my explorations, time not permitting of my proceeding further in a westerly direction. I returned passing through another and larger village of the Wahadinu, surrounded by large mango trees, coco-nut and banana clumps. I noticed leaves of tobacco tied in "hands," or bunches, and hung up to dry on the outside walls of the houses; the largest leaves were about 8 inches by 4½ inches, six-veined and light yellow in colour. The fields were always protected by coral-stone walls against the wild pigs. Again descending, but by a different path, into the Waanda or coral valley, the coral outcrop presented here the appearance of grey lava; in some places it so completely covered the ground that it was absolutely impossible to distinguish the nature of the soil, yet all around was thick bush. The soil, where discernible, was black, very friable and fibrous. About the centre of the valley I came across another small Wahadinu clearing, about half-an-acre in extent, the coral rock being here bleached white from exposure.

Tobacco was growing in this clearing. The plants are not topped, but allowed to flower, and these were from 4 to 5 feet high, thin and lanky in appearance, the flowers pinky-white, and the lance-shaped leaves from 5 to 10 inches long by 4½ to 5 inches wide. Where the bush had been burnt, bracken-fern had sprung up. It is a curious fact that the thicker the coral outcrop, the denser the bush; and I remarked that on leaving the latter, and emerging once more on the grass plain below Dunga Hill, the coral was less noticeable. Close to the hill the soil improves, and in the thicker bush existing here I again noticed the increased outcrop of coral. We finally got back to Dunga plantation after a very hot and tiring tramp over the coral rocks, it having taken us two and a half hours to traverse the distance between the two ridges of Waanda Kitowoni and Dunga. The country beyond the former ridge, I was told, also presented the same characteristics—bush and thick coral. I left Dunga at 7 a.m. on

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March 28, on my return to Zanzibar, proceeding in a southerly direction along the Dunga ridge, having on my right a continuation of the uncultivated M'Zingam plain, whilst on my left lay the coral plain, traversed the day before. At first the country, named "Wangwa (or Waanda) a Dunga," is uncultivated and overgrown with bush and high grass; it is flat, with coral outcrop in patches, and the soil appears good—a dark consistent brown loam. Beyond this it gradually improves, and I passed at long intervals a few native gardens with coco-nuts, mangoes, jack trees and cassava; the clove cultivation being limited to scattered trees.

Further on, the soil became a lighter loam with more coral outcrop, its depth evidenced by the fine mangoes growing here and there in the uncleared land, these trees being also evidence of a former cultivation. Beyond a shamba called "Jonga" the soil changes to red, and in places to a dark chocolate loam, with high bush and bracken. I noticed in the few scattered clove trees that the young flower buds were just beginning to shoot. The country along here may still be described as very slightly cultivated—only a few scattered shambas were to be seen, and occasional coco-nut trees. This large extent of now uncultivated land was once all under metamah (*Sorghum vulgare*), or millet cultivation, and on both sides of the path extend the abandoned fields, still surrounded by their protecting walls of coral-stone. All this country was formerly the property of the last "Sultan" of Dunga, Muini Ku Wadunga, and cultivated by his people. The Dunga ridge gradually slopes down to the surrounding country, and we now left it behind by striking westward and crossing an uncultivated valley, beyond which we entered a richer and more cultivated area. This district is called Jumbvi, and the cultivation was luxuriant and of considerable extent, with extensive groves of thickly-planted coco-nuts, numerous jack and orange trees, areca palms, banana clumps, and ground cultivation, including some ground-nuts and capsicums. I turned off the main road at a small flooded valley, to visit M'Korogo Hill. All the country at its base is flat, coco-nuts being the chief product; some mangoes which I saw here

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were really immense trees. The cultivation included both "mjugu mawe," the Bambarra ground-nut (*Voandzeia subterranea*), producing small white round nuts, chiefly an article of food, being boiled and eaten; and "mjugu nyassa," the ground-nut of commerce (*Arachis hypogæa*).

To my repeated inquiries as to the cause of so much uncleared land, the invariable answer was always "want of labour;" the people readily admit the fact that many fertile areas are left uncultivated, but say: "What can we do? we have no slaves!"

Returning to the Zanzibar main road and continuing due west, I proceeded over gently undulating ground, the soil being still rich and fertile. The cultivation here presented quite a different aspect from that of the other parts of the island, cloves being absent—a fact explained by the character of the soil, which consists entirely of a grey to black sandy loam. However, on its suddenly changing to stiff red loam, clove trees appeared once more, at first scattered, but gradually increasing in numbers. The chief cultivation, however, was cassava, the plants being in places fully 8 feet high, fields of it extending on both sides of the way. The system practised here is to cultivate the land with cassava for one or two years, and then let it lie fallow, this being the only means of recuperation for the soil. Jumbvi is undoubtedly, on the whole, a rich and fertile district, but much marred by a large extent of uncultivated land. The water is supplied altogether from wells.

Leaving Jumbvi district and passing on to that of Mwera, the way led through several "wangwa," the soil of these being still black, but less friable than at Dunga, and showing much disintegrated coral, coral outcrop, and grass. Beyond, the country resumed its fertility, with clumps of coco-nuts and oranges, and patches of cassava. I next passed by a series of pools and flat grass-land, which are flooded in the wet season. Diverging again from the direct Zanzibar road to visit "Bonde la Mzungu," I passed on the way "Mwera," a large and much-neglected plantation of mixed cultivation. The whole place was simply overgrown, and many of the clove trees were almost hidden by bush and creepers, the place

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having been evidently untouched for months past. The soil was red to chocolate, with a clay subsoil, becoming black and clayey in the swampy valley of "Bonde la Mzungu." The river Mwera, which is here about 5 feet wide, and shallow, flows in at the upper end, disappearing suddenly underground through a cavity in a coral rock situated in the middle of the valley. The river can be heard gurgling and rushing underground (the fall evidently being very rapid), and only reappears on the sea-beach, miles away. The mouth of the cavity is comparatively small, and the greater portion of the water spreads out around the rock, forming a swamp, which in the rainy season attains large proportions. At this time the swamp was overgrown with high coarse grass, and occasional patches of sugar-cane.

On the other side of the river the land was flat, with a coral outcrop, and in the main uncleared; the cultivation was chiefly cassava and sweet potatoes, with scattered clumps of mangoes and coco-nut trees, and occasionally small clove shambas. One of these, named "Kikokani" (from "Kikoka," creeping grass), about a mile from the swamp, consisted chiefly of young clove plants. The soil was now brown loam and more consistent. In the Fuoni district, through which I next passed, I noticed a good deal of ground-nut cultivation and thick groves of coco-nuts; there was a fine road, 20 feet wide, planted on both sides with young clove trees, but these excellent roads are only to be found close to the town of Zanzibar.

I was now about one hour's march from Zanzibar (3 to 3½ miles), and here again I crossed a river, the Mwera Korokwé, flowing through a low valley, named Bonde la Mwera Korokwé. Beyond it, I resumed my march over an open, flat plain, totally uncultivated, with a deep white to grey sandy soil, which made walking in places very heavy and trying. On approaching Zanzibar the houses became numerous and larger, surrounded with banana clumps, coco-nuts, mango, and other trees.

Although I noticed but few clove trees, and these planted chiefly along avenues and round houses, I was impressed with the fact that, though perhaps not so fine as elsewhere, they

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could grow in this very sandy soil, proving how very congenial is the soil of this island to the clove, though, judging from the enormous size of some of the mango and jack trees, the subsoil probably makes amends for the sandy nature of the surface.

I finally reached the outskirts of the town of Zanzibar at 12 noon, on March 28, having marched steadily on since I left Dunga plantation at 7 a.m. that morning; I was not sorry to return to the rest and comparative comfort of my hotel, after ten days' examination of the country, which had entailed a good deal of arduous work, and many long and fatiguing marches.

Two days later I paid a most interesting visit to Sir John Kirk's garden at Mbweni, situated about four miles south of the town of Zanzibar. During the period Sir John Kirk resided at Zanzibar as her Majesty's Agent and Consul-General, he maintained at his own expense this experimental garden, in which he cultivated every useful tropical plant likely to be adaptable to the climate. His collection of plants is wonderfully large, and bears witness to much trouble, care and intelligence. My observations during my visit to the shamba were necessarily brief, but I subjoin some interesting information in Appendix F.

The estate now belongs to the Universities Mission; the soil consists of a friable grey to black, combined in places with a more consistent red to yellow loam, and is typical of the soil of the island generally, and therefore excellently adapted to the purpose Sir John Kirk had in view. Amongst the plants (many of which were quite new to me), I noticed Liberian coffee, neglected and suffering from leaf disease (*Hemeleia vastatrix*); three varieties of Eucalypti, the blue gum (*Eucalyptus globulus*), small and stunted, the other two red gums very luxuriant and over 40 feet high; one or two mahogany trees, also weak and unhealthy-looking, though I understand that the mahogany (*Swietenia mahogani*) is said to grow well on the island; cinnamon, pimento, cacao, tea, coco de mer (*Lodoicea*), producing the celebrated double coco-nut of the Seychelles; vanilla, varieties of plantain and banana from the interior, very large-leaved; tree-aloes, supported by curiously-shaped roots, and somewhat resembling



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the mangrove in growth; fine varieties of crotons; with many indigenous fruit and other trees, and, lastly, some rubbers, among which I noticed the several varieties of *Landolphiæ* (order *Apocynaceæ*), particularly the *L. Kirkii*, which the man in charge said grew with great luxuriance, covering everything, so that they had to be cut down. I was especially struck with the fine appearance of some Ceara rubber trees (*Manihot glaziovii*), and was informed that their growth was so rapid that they too had to be periodically cut down. I measured a very fine one, and found its girth to be 6 feet at 3½ feet from the ground. All the stumps of the trees had suckers shooting up again most vigorously.

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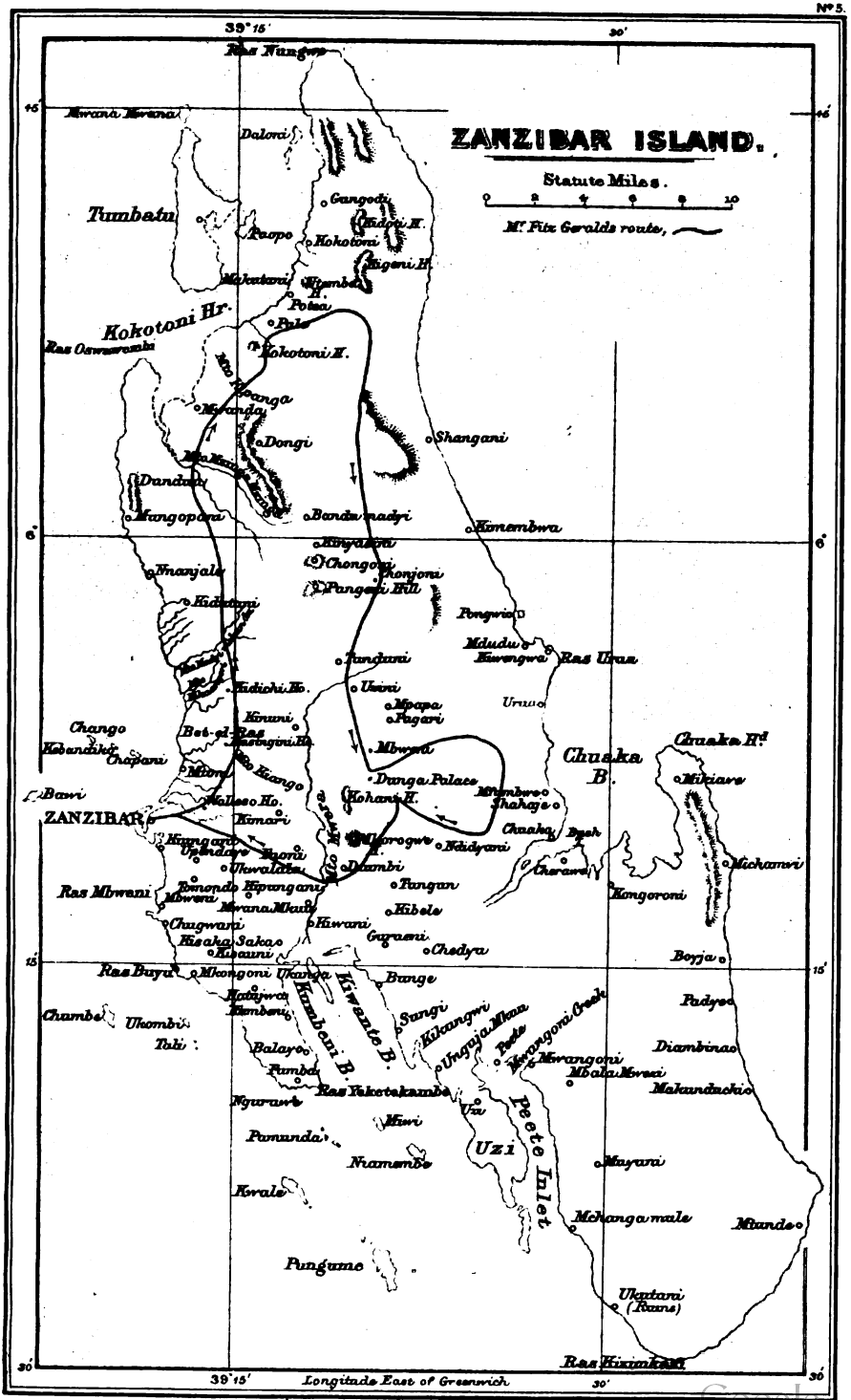


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# CHAPTER V

## CULTIVATION AND AGRICULTURE IN ZANZIBAR

Cultivated Products—The Labour Question—Desirability of Indian Immigration—Need of English Capital—Agricultural Capabilities of the Island.

I PROPOSE in this chapter to summarize the results of my observations on the cultivation and agriculture of the island, with the conclusions I have drawn from them.

On examining the vegetable products, wild and cultivated, growing on the island, one is impressed at once by their variety and number, notably in the case of those of commercial importance. In the list which I give below I have derived much assistance from Sir John Kirk's valuable paper on the subject.[1]

The chief cultivated COMMERCIAL PRODUCTS to which I shall refer are—The clove, coco-nut, betel-nut palm, and chillies.

Amongst FRUIT TREES are the following—The mango, jack (*Artocarpus integrifolia*, L.), papaw (*Carica papaya*, L.), all the principal varieties of the citrus or orange family, the custard apple, sour sop, sweet sop, litchi, rose apple, jambosa (*Eugenia jambolana*), "zimberao" (*Eugenia malaccensis*, L.), the bread-fruit (*Artocarpus incisa*, L.), pomegranate, the guava, the cashew nut (*Anacardium occidentale*, L.)—the last two very common, and found in most native gardens—the passion-fruit (the large *Grenadilla*), the common fig tree, date palm, vine (yields poorly), mulberry (the small Indian black variety),

[1] "The Agricultural Resources of Zanzibar," *Kew Bulletin*, No. 64, April 1892.



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durian (*Durio zibethinus*, D.C.), and the rambutan (*Nephelium lappaceum*, L.), introduced by the Sultan Seyyid Said fifty years ago.

Of SPICE TREES, in addition to the clove, the nutmeg, cinnamon, and pimento all grow and appear to do well, but no attention is paid to their cultivation.

Of OTHER PRODUCTS there are coffee, the arnotto plant (*Bixa orellana*, L., also common), cotton (*Gossypium* spp.), the silk-cotton tree, the oil palm (also indigenous on the island of Pemba, from which the kernels were exported in considerable quantities upwards of twenty years ago), and the Henna plant (growing everywhere).

Many valuable FOREIGN TREES and plants, most of which are doing well, have also been introduced, and Zanzibar owes a large debt of gratitude in this matter to the energy and enterprise of Sir John Kirk. Amongst many others may be mentioned—the jujube tree (*Zizyphus jujuba*, Lam.), the avocado pear (*Persea gratissima*, Gærtn.), cacao, tea, Ceara rubber, *Hevea brasiliensis* (the Para rubber), logwood (which grows well and appears well adapted to the soil and climate), Liberian coffee, mahogany, the mangosteen, Chinese cassia (*Cinnamomum cassia*, Bl.), and the American aloe.

Of ALIMENTARY PLANTS, the sugar-cane, bananas, cassava or manioc, arrowroot, the Bambarra ground-nut (*Voandzeia subterranea*, Thouars), called locally "mjugu mawe," may be mentioned. There are also several varieties of beans, peas, and pulse, including the Congo pea (*Cajanus indicus*).

The GRAINS include rice, maize, two varieties of millet (*Sorghum vulgare* and *Pennisetum typhoideum*), and also raggy (*Eleusine coracana*).

VEGETABLES—The tomato (very common), yams, pumpkin, brinjal (*Solanum melongena*), sweet potato (*Batatas edulis*, Lam.), vegetable-marrow, etc.

OIL PLANTS—The ground or earth-nut (*Arachis hypogæa*), gingelly (*Sesamum indicum*), locally known as "sim-sim," the castor-oil plant, and also a Cucurbitaceous plant (*Telfairia occidentalis*).

DYES—Indigo and orchella weed.

FIBRE-YIELDING PLANTS—Of aloes, the two varieties of

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*Furcræa gigantea*, the Mauritius hemp, grow well; of the *Sansevieria* species common on the island, Sir John Kirk remarks that they compare unfavourably with the mainland variety, being too short in the fibre to have any commercial value. The common pineapple may be included among the fibre-yielding plants; it grows most luxuriantly in a half-wild state.

CULTIVATION.—Cultivation is carried on almost entirely by slaves, with the exception of the few free labourers hired in the height of the clove-picking season. At the time of my visit, a scarcity of labourers was affecting all estates, not excepting those of the Sultan, and this want is forcibly exemplified by the large area of abandoned fertile land. The chief product of the island being that of the clove tree, which requires a large supply of labour, this labour question becomes a serious and important one, and upon its solution all future agricultural development will depend. Pending that solution, not only is the general prosperity of the island and that of owners of estates at stake, but the public revenue (which is raised chiefly from the tax upon cloves) is equally jeopardized, and the enterprise of Government crippled, whilst the interests of British Indian subjects, who have advanced large sums of money on the security of the estates, are menaced with serious loss. It is evident that the slave population has greatly diminished, and continues to do so, under our preventative measures put in force against importation of slaves from the mainland[1]; and it is the *consequences* of this that claim our consideration. The character borne by freed slaves for industry, or willingness to work without supervision, is so little encouraging that estate proprietors, and those whose capital is involved in the successful cultivation of estates, may justly contemplate with dismay the prospect of dependence upon a labour supply of that unreliable character!

Imported labour appears the only remedy. No dependence can be placed upon importation of free labour from the African mainland, for the Swahili of the coast, as well as the native tribes beyond, are not the material from which a

[1] Since these lines were written the status of slavery has been abolished in the islands of Zanzibar and Pemba.

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labour supply could be drawn with any immediate chance of success. These inland tribes are on the whole better workers than the somewhat enervated coast people, but with the encouragement and protection which an organized Government will afford them, both they and the Swahili will have ample scope for industry in their own country, and this will effectually counteract all inducements to seek work in the islands.

Everything points to the conclusion that it is to the introduction of labour from elsewhere that Zanzibar, Pemba, and the British coast generally must look for the means of future development. If places so distant as the West Indies are enabled, since the abolition of slavery, to thoroughly depend upon a foreign labour supply, Zanzibar, so much more advantageously situated, need not have any apprehension on this score. Mauritius may be cited as a case in point. Zanzibar and the neighbouring coast have been for many years so intimately associated with India, commercially and politically, that they offer a natural and specially favourable outlet for the settlement of the overflowing population of our Indian empire. Moreover, the introduction of a steady, industrious, and intelligent people would prove of the highest advantage, stimulating and educating by their example and presence, both the indolent freed slaves and the Swahili. The importance of placing speedily within reach of the landowners, all the advantages of a free imported labour, seems to afford a strong argument in favour of compensation for the loss of their present labour supply; nor, from a purely economic point of view, does it appear to be sound policy on the part of the Zanzibar Government to allow the value of landed securities, on which large sums have been advanced, to be further impaired, nor to leave the impoverished landowners to struggle unassisted towards a newer and better state of things.

Given the necessary capital for its employment, free imported Indian labour could not fail to bring about large and immediate results, both by the increased area restored to cultivation, and the newer and more lucrative methods that would be quickly introduced.

This question of capital now brings us to another important aspect of the future development of the country. Undoubt-

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edly the great factor required for the full development of the latent wealth of the soil is the encouragement of European capital and enterprise. In a letter I received from Sir John Kirk in the early part of last year, that experienced and high authority pointed to the success of the coffee plantation in Nyasaland, and the encouragement to scientific research given by our active commissioner, Sir Harry Johnston, and added: "There is much need for the same help in East Africa, and still more do we there require some Scotch planters, men with small capital, but men who are content to settle and work hard at the beginning."

The sooner European enterprise can be attracted, the quicker will development commence. The Government can do much to bring this about by making better known the fertility of the country and its adaptability for the cultivation of so many remunerative products. I would also suggest the extension of roads throughout the island. The importation of cattle as draught animals for cart traffic would also conduce very greatly to agricultural development, for at present (I speak of the time of my visit) the only means of conveying produce to the coast is on porters' heads.

In the earlier part of this volume I have drawn attention to the marked similarity, as regards temperature, between Zanzibar and Kingston (Jamaica), and I would further emphasize this similarity to the West Indies by quoting a table of the temperature and rain-fall of the island of Trinidad, the great cacao-producing island of that region, for which I am indebted to Mr. J. H. Hart's valuable hand-book on cacao cultivation.[1]

*The Temperature, etc., Record of the Trinidad Royal Botanic Gardens.*

| | ° | Ins. |
|---|---|---|
| Mean of 4 years, ending 1890 . . . | 78·6 | — |
| Minimum . . . . . | 69·4 | — |
| Maximum . . . . . | 86·8 | — |
| Mean annual humidity . . . . . | 79·0 | — |
| The 4 years' mean rain-fall was . . . | — | 71·55 |
| The mean for 35 years was . . . . | — | 64·49 |

[1] *Cocoa; its Natural History, Culture, and Preparation*, by J. H. Hart, F.L.S., Superintendent of the Trinidad Royal Botanic Gardens.

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Then as to the soil: "The land," it is stated in letters from Jamaica (*Tropical Agriculturist*, December 1891), "is flat, the soil red as in parts of Devonshire, and there is a subsoil of marl." Thus it will be seen that a marked similarity in the matter of rain-fall, temperature, and soil exists between Zanzibar and the most productive islands of the West Indies, and there can be no doubt, indeed it is already evidenced by the interesting collection of plants made by Sir John Kirk at Mbweni, that the products cultivated in the lowlands of the West Indies can also be successfully introduced into Zanzibar.

The agricultural possibilities of Zanzibar appear to be so little known that I have dwelt fully upon the chief characteristics of its soil and cultivation, for not only are its present products capable of much greater development, but the soil, climate and rain-fall render it particularly suitable for the introduction and successful cultivation of many others. As I have shown, the soil can be described, with a few exceptions, as everywhere fertile, in some districts especially so. Undoubtedly the most important industries on the island consist in the cultivation of cloves and coco-nuts, and the acreage planted with these two products covers the principal portion of the cultivated area.

The native system of agriculture is evidently very backward, and the ordinary process is to allow exhausted land to revert back to grass and bush, to be reclaimed when required. The noxious weeds and grasses, especially "ilook," which this system encourages, do much harm by getting a strong hold upon the land, from which light hoeings, however frequent, with the primitive tool in use, will not dislodge them; I have noticed almost everywhere in newly-dug-up land, that the soil was matted and bound up with fibrous grass-roots.

Little or no manuring is done, the manure of camels, cows, goats, etc., being used in small gardens alone.

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# CHAPTER VI

## CLOVE CULTIVATION IN ZANZIBAR

Importance of the Clove—Its Introduction into Zanzibar—Method of Cultivation—Enemies of the Clove—Yield of Trees—Export—Necessary Reforms.

THE clove tree is undoubtedly the principal and most important product of Zanzibar, and is grown wherever possible, from the few trees owned by the more humble cultivator, to the extensive plantations belonging to the Sultan and wealthy Arabs.

This being the case, and if we bear in mind its possible extended development and improved cultivation, it follows that every fact relating to the character and nature of the tree becomes of importance, so for information, and purposes of comparison, I give as an appendix a description of the tree and the various methods that are adopted elsewhere in its cultivation and harvesting. (See Appendix G.)

The soil of Zanzibar is eminently adapted for the cultivation of the clove, being a dark loam, having underneath a layer of dusky yellow earth, intermixed with gravel; also a reddish-yellow stiff clay. The clove tree requires clay, and I observed there was always a marked difference in appearance between trees growing on a clay soil—red by preference—and those found on lighter ground. The finest trees were always growing either on red clay or on a stiff dark red to darker chocolate soil.

The clove tree (*Caryophyllus aromaticus*, Linn., formerly *Eugenia caryophyllata*) is a native of the Moluccas, and was first introduced into the island of Mauritius and Bourbon (Réunion) by the French in 1770. At the end of that



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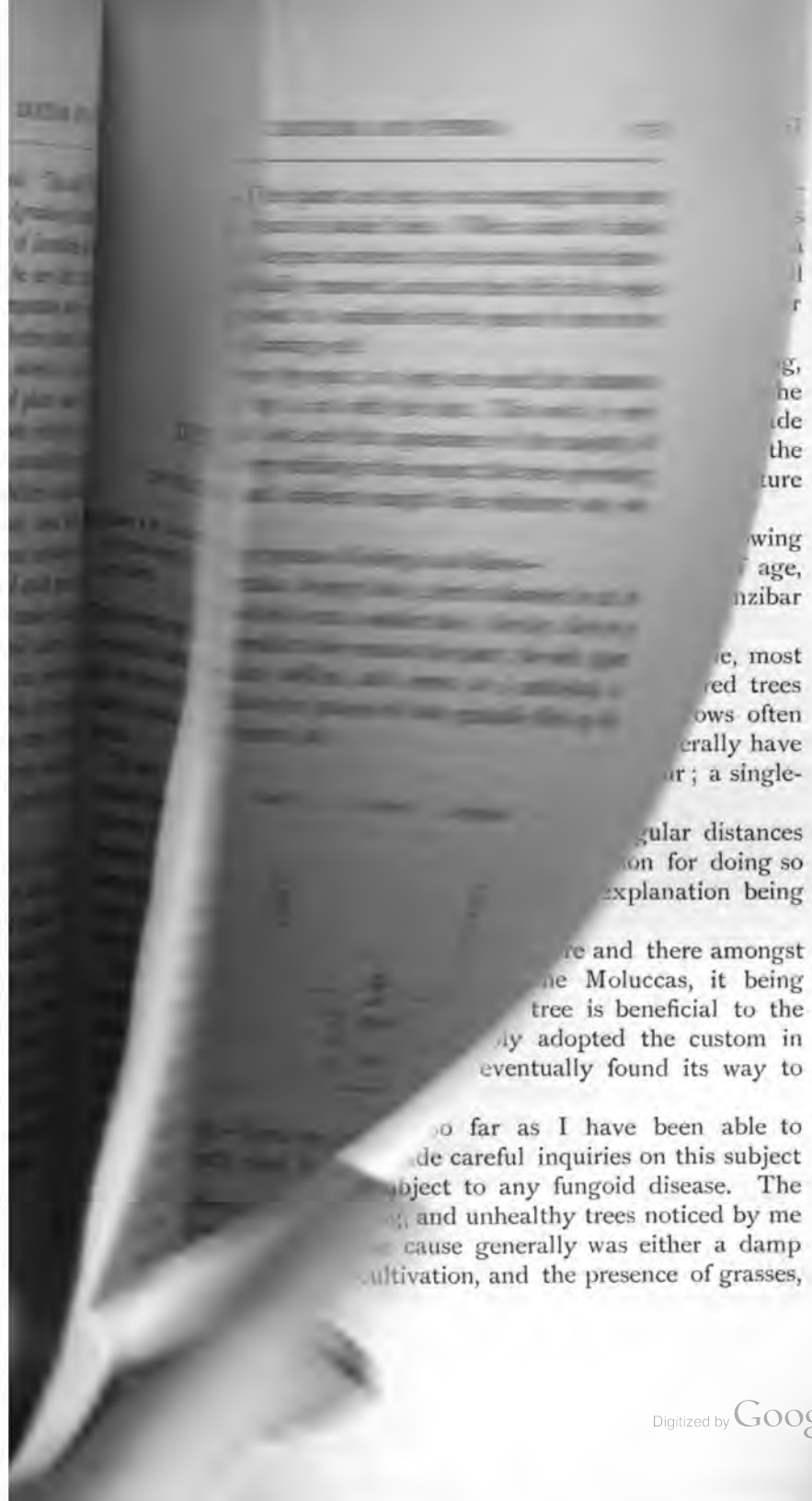

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century an Arab named Harameli-bin-Saleh, accompanied a French officer from Zanzibar to Bourbon, and obtained permission to take back a small quantity of seeds and plants with him. This was the commencement of the clove cultivation in Zanzibar, where, as in the island of Pemba, it gradually became the principal product, supplying an annual export of 7,000,000 to 11,000,000 lbs.

In 1872 a cyclone swept over the islands, causing terrible destruction amongst the clove plantations, which took many years to recover from it. The United States Consul reporting on the 1887-88 crop, which was the largest gathered since the hurricane, estimates it for Zanzibar alone at 1,400,000 lbs., and for Pemba Island at 3,500,000 lbs., making a total of 4,900,000 lbs., which realized £1,260,120, or an average of nine dollars a frasila. The cultivation has steadily increased, and the tree is now again the principal product of the island.

The different methods by which this cultivation is now carried on are evidently borrowed from the French. The Swahili word for clove, "garafu," is probably a corruption of the French word "giroflier."

*Nurseries.*—The seeds are first soaked in water for three days, and when germination has set in they are planted out 6 inches apart, with the bud end above ground, in shaded beds—the usual practice being to put down two seeds together in case of failure. If a large number of plants are to be grown the seeds are put down 3 to 4 inches apart only.

*Size of beds.*—Beds are about 6 feet wide, and of any length. They are shaded by a flat framework of sticks, over which is placed a layer of dry grass or coco-nut leaves; the height of this framework from the ground is about 3 to 3½ feet.

*Watering.*—There is no regular rule for this, the important point being to keep the beds constantly damp. The slaves in charge go over the nursery beds both morning and evening, watering any of which the surface has become dry, the practice being to sprinkle water with the hand from the water jar. As long as the seedling is not thoroughly developed, this is done every day; when the plants are above ground, every other day; when 6 inches high, once a week or ten days.

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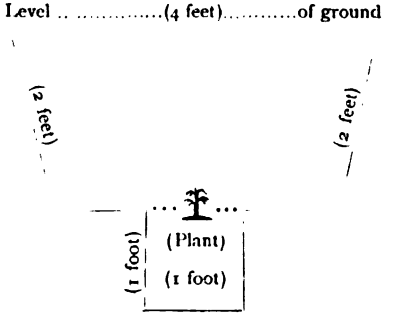
*Hardening.*—The plants are kept, on an average, from nine months to one year in shaded beds. When about 6 inches high they are by degrees hardened, by the thatch of the frame-work being gradually removed, and are then left in the open beds freely exposed to sunshine for the space of one or two months before planting out.[1]

*Lining* is done by rope; no pegs are used, the distances being marked by a cut with the hoe. This work is very carefully carried out, and the appearance of the majority of plantations is very striking in this respect, the trees presenting an unbroken and uniform straight line whichever way one looks.

*Holing.*—The process of holing is as follows—

A large circular sloping hole, 4 feet in diameter, is cut, in the centre of which is cut a smaller hole, 1 foot by 1 foot or 9 inches; this smaller hole receives the plant; the wide upper portion remains unfilled, and serves as a catch-drain or reservoir. This is in process of time gradually filled up by weeds, fallen leaves, etc.




*Planting.*—Special care is also taken in planting out. The earth round the plant is loosened by a peculiar

[1] The following information respecting the prices of seeds and plants may be of interest. As a rule no seed is sold, but, if a demand arises, one basketful (the ordinary "kikapo") is sold for 1 dollar. The price of 1000 hardened plants, 6 inches or more in height, is 16 dollars. Plants self-grown, under the trees, are sold at the same rates, the purchaser having to collect them.

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triangular-shaped spade called a "moaa," used especially on clove plantations in Zanzibar, in addition to the ordinary native "jembe," or hoe.

The plant is then carefully lifted out by the hand with as much earth adhering to the roots as possible, and placed upon two strips of banana fibre previously placed crosswise upon the ground. (Each strip of fibre is about 3 inches to 4 inches wide, by 1½ feet to 2 feet in length.) The four ends are then taken up and wrapped round the plant and firmly tied together. The plant is then carried to its destination,[1] the strips of fibre effectually keeping the earth in position. Before planting, the pieces of fibre passing beneath are cut at each corner, and the plant finally placed in the hole prepared for it and the earth heaped round; the four ends of the fibre left at the sides are then removed one by one; the bottom portion having been cut through, this can be done with ease.

After planting out, if the weather is hot, or in the event of drought, the young plant is watered in the evening daily, and watering is continued as required until it attains the height of 18 inches, or, roughly speaking, during the space of one year. The plants are not shaded in any way after planting out.

*The young plants: weeding*, etc.—At this time weeding is performed every week, and the ground kept perfectly clean, otherwise the plant would die. There appears to be great mortality amongst the young plants, so that gaps have often to be filled up, and a nursery is deemed indispensable for five years after a plantation is first opened up. Probably if they were shaded until established, placed at a higher level, less frequently watered, and better hardened before planting out, this excessive mortality would be checked.

*After-cultivation.*—As a general rule no ground or other

[1] The planting distances appear to vary, and no regular rules appear to exist. The most customary, as given to me by Ragu, the head-overseer of the Sultan's plantations, is 16 thiraa (24 English feet) apart, but in small plantations it is 3 pima (18 feet), rising in larger ones to 6 pima (36 feet).

ZANZIBAR MEASURES OF LENGTH.

2 thiraa = 1 yard = 1 wari.
2 wari = 1 pima = 1 fathom or 6 feet.

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cultivation is permitted amongst the cloves, but slaves everywhere appear free to cultivate their own plots and gardens amongst the trees, and I have observed cassava growing in a clearing of young clove trees; the general run of small "shambas" consists of cloves, coco-nuts, mangoes, and other fruit trees, all planted indiscriminately and close together.

No pruning whatever appears to be done, nor manuring, apart from the accumulation of fallen leaves; this, in the more favoured localities where the rows of clove trees shade the ground, must add greatly to the fertility of the soil, the accumulation of leaves being considerable, and the flat nature of the ground preventing wash.

*Age and appearance of trees.*—There are some trees growing on the island which are said to be nearly ninety years of age, but the average length of life of the clove trees in Zanzibar appears to be from sixty to seventy years.

The appearance of clove plantations is, as a rule, most healthy and luxuriant, the height of the more matured trees averaging fully 40 feet, the branches of the two rows often completely shading the ground. Clove trees generally have forked stems, and often as many as three or four; a single-boled tree is the exception.

Coco-nut trees are generally planted at irregular distances between the rows of clove trees, but the reason for doing so appears to be quite forgotten, the usual explanation being that "it was the custom."

Coco-nut trees are usually planted here and there amongst the clove trees in Amboyna and the Moluccas, it being believed that the proximity of this tree is beneficial to the clove. The French most probably adopted the custom in Mauritius and Réunion, and it eventually found its way to Zanzibar.

*Diseases and enemies.*—So far as I have been able to ascertain—and I have made careful inquiries on this subject—the clove tree is not subject to any fungoid disease. The percentage of dead, dying, and unhealthy trees noticed by me was very small, and the cause generally was either a damp situation, or want of cultivation, and the presence of grasses, especially "ilook."

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Where labour is available (*i.e.* where there are enough slaves), the shamba should be weededevery month, but the average interval, I was told, is three months, and on the Sultan's plantation at Chueni, judging from the weeds and grasses upon it, it must have been even longer. These irregular and heavy weedings are very harmful to the clove.

The clove tree suffers from attacks of two enemies—one, a caterpillar, which attacks the foliage in the dry weather and often denudes the tree of its leaves (the tree recovers as soon as the rains set in); the other is the white ant, which occasionally attacks the roots. No remedial measures appear to be taken.

*Time of bearing.*—Clove trees begin to yield—

In good situations, five years from planting.

In inferior soil, six years to six and a half years from planting.

*Yield of trees.*—The Sultan's head-overseer told me that the general yield is 2 frasilas to three trees, and the average yield may be stated at 500 frasilas to 400 trees, or 4 lbs. 6 oz. per tree. The usual estimate is 5 lbs. per tree, but the clove tree is a most uncertain yielder, one year giving an enormous crop and the next year nothing; and again, individual trees in favourable situations yield very much above the average. The low average yielded by Zanzibar estates is probably due to want of proper cultivation.

*Colour of the buds.*—The unexpanded buds on the trees are at first a pinkish-yellow, becoming a deeper red as they mature. Red is the colour desired in the dried clove, and buds of this colour are more valued than those which are black.

*Gathering.*—The picking of the buds commences in August and lasts for four months; on an average each tree is picked three times in a season, for the buds ripen unequally, on which account it is necessary to go over the trees several times. The stalks and buds are gathered at the same time, and thrown on to grass mats spread on the ground; the picking of the higher branches is done by means of triangular bamboo ladders. Whilst some of the slaves are thus occupied, others pick the buds from the stalks, and they are then spread out to dry in the sun, being taken in every night.

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*Curing.*—The cloves are dried on mats in the sun (contrary to the practice in Penang and the Moluccas), and the drying is continued for six or seven days.

Green cloves dry down to about half their weight; thus 1 frasila green is equal to ½ frasila dry.

*Hired labour.*—On plantations where slaves are not sufficient, hired labourers (called "kibarua" from the ticket they receive daily) are employed. Each gatherer keeps a separate basket, and in the evening, each man measures out the clove-buds which he has picked during the day, and from which he has to remove the stalks.

At the commencement of the season pice are given; later on, the pickers are paid in kind.

Five pice are paid for each "pishi" (about 6 lbs.) of green cloves.

In favourable seasons the picker receives half of what he gathers; in short seasons only a quarter.

*Clove stems.*—The measurements and payments are for the buds only, nothing being given for the stalks, which are the property of the owner.[1]

*Disposal of the crop: Government duty.*—Cloves are despatched to Zanzibar in gunny bags. There is a duty, levied by Government, of 25 per cent.; this is paid in kind, and the cloves heaped in bulk in the Government godowns.

Public auctions are now held by Government every fortnight, to allow open competition, and especially to admit European merchants.

*Comparison between Zanzibar and Pemba cloves.*—Zanzibar cloves are very dry, differing much in this respect from those produced in Pemba. Zanzibar cloves can be stored for some time, but "Pembas" are disposed of as early as possible, as otherwise the loss is very great, as they generally arrive damp, and there is much "shortage" when dried. In good dry samples, the Pemba clove is smaller and blacker than others—blacker from having contained much moisture. Zanzibar

[1] At the time I was in Zanzibar, the value of a frasila of buds was 6 rupees. It will be seen therefore that the produce was worth to the owner 11 pice per lb., plus the stalks, or 10 pice after paying the wages of picking (5 pice per 6 lbs.).

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cloves are larger, and the red appearance of the dried buds is unmistakable; they are well known as "Zanzibar red-heads."

The difference between Zanzibar and Pemba cloves is well recognized in Europe. Large shipments of both varieties are made to Bombay, where they are very probably mixed.

*Mode of shipment.*—Cloves are generally exported in double mat-bags ("makanda") in preference to gunnies, though there is more shortage—in fact, the difference is marked; the mat-bags apparently permit a greater absorption of damp. The amount of shortage in the weight of cloves between Zanzibar and Europe equals 8 per cent.

*Clove stalks.*—Large exports of clove stalks are also made to both Bombay and New York.

*Export.*—The following were the exports of cloves during the six years ending with 1895—

| Years | Zanzibar Cloves | Pemba Cloves | Total |
|---|---|---|---|
| | Frasilas | Frasilas | Frasilas |
| 1890 | 124,929 | 384,933 | 509,862 |
| 1891 | 69,388 | 324,252 | 393,640 |
| 1892 | 121,398 | 236,211 | 357,609 |
| 1893 | 108,090 | 259,367 | 367,457 |
| 1894 | 138,691 | 372,999 | 511,690 |
| 1895 | 146,397 | 391,460 | 537,460 |

1 Frasila = 35 lbs.

"From this table it will be seen that the production of cloves during the year ended December last is the largest of the series, being 901,950 lbs. in advance of that of 1894. The crop of the 1894-95 season was a better one than was anticipated, the second pickings making up for the deficiency of the first. Prices during the first three-quarters of the year remained fairly steady, the average for Zanzibar cloves being 2 dollars 62 cents, and for Pemba cloves 2 dollars 30 cents per 1 frasila, but during the last three months of the year, at the beginning of the new crop, there was a considerable fall, which continued up to the end of the year, and which caused the average for that period to be 2 dollars 10 cents for Zanzibar, and 1 dollar 73 cents per 1 frasila for Pemba cloves.

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This tends to prove that the continued heavy crops have caused a glut in the home markets, although shipments at the lower price are still being made, especially to Bombay, Marseilles, and Hamburg, which three ports absorbed most of the consignments during the last half of the year, London taking a comparatively small quantity."—*Consul-General's Report on the Trade of Zanzibar for the year* 1895.

The actual revenue derived by the Zanzibar Government from this source in the year 1894 was—

| | Rs. | A. | P. |
|---|---|---|---|
| Zanzibar cloves ... ... ... ... | 178,435 | 14 | 9 |
| Pemba cloves ... ... ... ... | 357,788 | 11 | 0 |
| Clove stems ... ... ... ... | 7,114 | 2 | 6 |
| Mother of cloves ... ... ... | 486 | 14 | 6 |
| Rupees | 543,825 | 10 | 9 |

I have pointed out that agriculture in Zanzibar and Pemba is at present in a somewhat precarious position, depending as it does on an uncertain labour supply, and on one article of produce (admittedly not a necessity of life, and liable also to destruction by a cyclone, as in 1872). Due consideration must therefore be given to these facts: firstly, that the soil and climate of Zanzibar and Pemba are eminently adapted to the cultivation of the clove tree; secondly, that the large clove plantations on the former island consist chiefly of trees planted since the cyclone of 1872, so that, for many years to come, cloves must continue to be the principal and most important export. It becomes, therefore, an essential question whether the present very low prices ruling for this produce cannot be improved; and whether, by due precaution, the possible danger of destruction by cyclones could not be averted. There can be no two opinions as to the importance of these questions.

To take the former question first, it is acknowledged that the produce of Zanzibar and Pemba differs, to the advantage of the former, the latter absorbing a considerable amount of moisture during its transit to Zanzibar, in the unsuitable and ill-protected native dhows in which the cloves are generally brought across. It is, nevertheless, unfortunately the fact



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that Zanzibar cloves, no less than those of Pemba, at present occupy the lowest position in the London market. Adulteration with stems may contribute towards this result, but the low prices of the buds must be due to some other cause. The value of cloves depends on their plumpness, brightness of tint, and yield in essential oil. Now Zanzibar and Pemba stand alone in the practice of drying the buds in direct sunlight, that process causing the buds to shrivel, and evaporating much more of their strength than when they are dried in the shade. The methods used in other countries, particularly in Penang and the Moluccas, totally differ from those in force in Zanzibar. (For fuller particulars and information see Appendix G.) I give here quotations from the London produce markets report of sales in March and May 1896—

| *March* 1896. | *May* 1896. |
|---|---|
| *Penang.* Dull to fine bright bold, 7*d.* to 11*d.* | *Penang.* Dull to fine bright bold, 7*d.* to 11*d.* |
| *Amboyna.* Dull to fine, $3\frac{1}{4}$*d.* to $4\frac{3}{4}$*d.* | *Amboyna.* Dull to fine, $3\frac{1}{4}$*d.* to $4\frac{3}{4}$*d.* |
| *Zanzibar and Pemba.* | *Zanzibar and Pemba.* |
| Good and fine bright, $2\frac{3}{8}$*d.* to $2\frac{1}{2}$*d.* | Good and fine bright, $2\frac{1}{4}$*d.* to $2\frac{1}{2}$*d.* |
| Common dull to fair, $1\frac{7}{8}$*d.* to $2\frac{1}{4}$*d.* | Common dull to fair, $1\frac{7}{8}$*d.* to $2\frac{5}{16}$*d.* |
| Stems, fair, 1*d.* | Stems, fair, 1*d.* |

This then is the present unsatisfactory state of the Zanzibar clove market, and it deserves the serious attention of the Government.[1] Every endeavour should be made to discover the cause. I think that both the method of curing and the adulteration are at fault, for the climate and soil are undoubtedly most favourable to this cultivation. When these evils

[1] Since the above was written, I have observed with pleasure that the Government are taking energetic steps to prevent adulteration; *vide* the Consul-General's Report for 1895—

"It is satisfactory to note that during the year 1895 there have been three prosecutions and convictions under the proclamation of his Highness the Sultan, and the regulations issued by her Majesty's Agency and Consulate-General, for the adulteration of cloves. The cloves, which were, in these instances, imported by British Indians from Pemba, were found to be adulterated with salt, and were seized and publicly burned, and this action has already had a deterrent effect on a practice which was becoming far too common."

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are remedied, a rise in the market value means an immediate and important increase in the Government revenue.

Now, as to preventing destruction by cyclones, I would recommend "shelter trees," employed so successfully in Sumatra, where the clove plantations are protected by rows of wind-resisting trees, such as Calaba (*Calophyllum calaba*), *Cerbera manghas*, and *Casuarina littorea*. "Wind-belts" of these, planted round boundaries, plantations, and on ridges, would prove a great protection; I can bear testimony to their advantages, and strongly recommend their adoption in Zanzibar. There is another most useful tree, the *Grevillea robusta* (the silky oak of Queensland), which is very highly thought of in India, as, apart from its wind-resisting power, it is remarkable for greatly enriching the soil by the quantity of leaves it sheds. It is hardy, vigorous, quick-growing, and very easily propagated, but in Ceylon it does not thrive too close to the sea.

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## CHAPTER VII

### OTHER PRODUCTS OF ZANZIBAR

The Coco-nut and its Products—Betel-nuts and Betel Pepper—Mango and other Fruit Trees—Alimentary Plants—Banana Fibre—Grains—Ground-nuts—Chillies—Dyes—Domestic Animals in Zanzibar.

LIKE the clove, the *coco-nut cultivation* suffered terribly from the cyclone of 1872, and to such an extent, that whereas the value of the exports of coco-nut and copra before the hurricane amounted to nearly £200,000 per annum, in 1895 it had fallen to £57,529 sterling, proving how terrible was the disaster and how much leeway has yet to be made up. To summarize the chief facts respecting the coco-nut and its industries: its cultivation is very scattered except in a few regular plantations, where the trees are planted on an average from 15 to 20 and 30 feet apart; elsewhere they are grown too thickly and closely together. They bear in their eighth year, and the nuts are picked about four times annually. Where overcrowded or neglected the average yield is from 50 to 100 nuts, that of ordinary trees is from 120 to 200, and in favourable situations up to 300 nuts a year. When grown among cloves the trees are lanky in appearance and yield poorly. The average price of nuts in 1892 was from $20 to $25 per 1000.

*Copra* is exported, but not to the extent it might be; greater development in this product may, however, be now expected, as European firms are giving more attention to it. The largest trade done at present is with France, practically all the copra being shipped to Marseilles.



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The following are the exports of copra for the years 1894 and 1895—

| | | |
|---|---|---|
| 1894. | 108,321 packages. | Value £57,127. |
| 1895. | 11,738,496 lbs. | Value £57,529. |

*Coir.*—Until quite recently no use was made of the husks. They were thrown away or burned as fuel, and the small amount of coir that was made was manufactured by natives from the Comoro Islands. At the time of my visit, an English firm had just imported machinery for its manufacture. This speaks well for the future development of the industry.

*Toddy* is simply sold for drinking and for making vinegar, "su-siki." Toddy syrup, a species of sugar or syrup, is made by boiling toddy in a pot for half-an-hour, and is sold at 2 pice a cup.

"Asali ya tembo" = syrup made from toddy.

"Asali ya mua" = the boiled juice of the sugar-cane.

*Pemba coco-nut.*—There is a dwarf variety, the Pemba coco-nut, which, as its name implies, is a native of that island. It is a handsome ornamental palm, easily distinguished by its small size and marked yellow midribs; the nuts are also much smaller and of a dark yellow colour. This variety is esteemed for its quicker yield, as it bears in five years instead of eight. The fruit appears to be chiefly valued for drinking purposes, the water in the immature nut being very sweet. The yield of fibre is very small. The trees are generally planted along paths and near houses, or in small clumps, 20 to 26 feet apart, and often closer. It is unnecessary for me to point out the great advantages resulting from a more enlightened cultivation of the coco-nut palm, for so many useful hand-books on the subject are now procurable. The statement is made that young coco-nut trees, both in Zanzibar and the mainland, are peculiarly liable to the attacks of a large rhinoceros beetle: this is nothing unusual, and need not cause apprehension, the red and black beetles being only too well known as enemies that coco-nut planters have to contend against.[1]

[1] "We have only two species of beetle that attack the coco-nut tree in Ceylon. The 'kuruminiya,' a large black one, breeds in dung-heaps and in accumulations of decaying vegetable matter. It cuts into the cabbage

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The new road which has just been constructed across the centre of the island connecting Zanzibar with Chuaka on the east coast should do much towards developing the export of agricultural produce, for it passes through the richest and most cultivated portion of the island, and (as I pointed out in my report of 1892) it enables the more distant shamba owners to despatch their produce to the coast in wheeled vehicles instead of on porters' heads. This road is due to the initiative of Sir Lloyd Mathews, the first Minister of Zanzibar, and is referred to very fully in the Government report issued in 1895.[1]

The *Betel-nut palm* (*Areca catechu*, L.) is grown only in small clumps around houses and in closely-planted rows along roadsides and avenues. The cultivation of this most handsome palm, which begins to yield in its fifth year, could,

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and feeds on the tender undeveloped leaves, the effects of which are cut and ragged leaves in after life. It does not breed in the tree, but merely dines and departs. Few trees in a plantation entirely escape, and some that are much to their taste are kept in a chronic state of disreputable raggedness. The other is the red beetle, 'kandapauwa' (eating worm) of the Sinhalese. The dangerous time with this foe is from the time the stem shows above ground till it begins to flower. It has a strong frontal horn, with which it can enlarge to its purpose any crack or wound on the stem, but it cannot penetrate the ripe rind. The rapid extension of the stem in a quick-growing tree often splits the base of a leaf; and in the crack so produced the young grub lives on the substance of the leaf till strong enough to gnaw its way into the stem. Split leaves should therefore be carefully removed as soon as noticed; but all whole ones should be allowed to remain on the stem till they rot, the danger of removing them being breaking the surface of the stem or exposing it before it is sufficiently hardened. When the grub is detected in a tree, the safest way of dealing with it is to root it out, cut it into chips, and collect and destroy the insects in all their stages. Fortunately the whole colony sticks to one tree, as long as it stands, and the whole family, sometimes amounting to 150, can be disposed of at once. The grand precaution is never to trim the leaves within 3 feet of the stem: nine-tenths of the trees destroyed by this insect on Ceylon plantations have been due to wounds inflicted on the stems in trimming off dead leaves.

"NOTE.—18 feet is the length of the leaf of a mature thriving tree." (*Tropical Agriculturist*, July 1891.)

[1] Africa, No. 5 (1895) Report on the Revenue and Administration of Zanzibar in 1894.

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I think, be largely extended. It grows well in sandy soil, and there are in various parts of the island many localities well adapted to its cultivation, as for instance between Chueni and Kokotoni and the sandy plains to the east of Zanzibar town. Its produce not only supplies a large local demand, but the nuts are also exported, and the Customs Revenue from this source alone in 1894 amounted to Rs. 10,240.

The *Betel-vine* (*Piper betel*, L.), the leaves of which are chewed in conjunction with the betel-nut, is usually found in most native villages carefully fenced in and shaded.

One is especially struck in Zanzibar, as I have more than once mentioned, with the appearance of the large and magnificent *Mango* trees. This tree (*Mangifera indica*, L.) is evidently a favourite with both the Arab and Swahili cultivator. Accordingly it forms a prominent object among the various trees and products cultivated, and is found everywhere; every soil appears to suit it, and its robust and luxuriant appearance is most marked. The mango was introduced in olden times by Arabs, and there are in the islands trees of great age and many varieties. More recently, Sir John Kirk states, new kinds have been introduced from Réunion and Bombay, but there are few better than those already grown in Zanzibar. The trees bear largely, and some of the finer varieties of fruit are noted for their delicacy of flavour. The mango bears fruit twice in the year, after the south-west monsoon rains in July and August, and after the north-east monsoon rains in January and February. The *Jack* or Jacca (*Artocarpus integrifolia*) is another favourite tree, but not so extensively grown as the mango. At present both these trees appear to be cultivated for their fruit alone. Their timber (so valuable for furniture-making purposes, and so much utilized in India) is little if at all used. Neither is any advantage taken of the facilities for shade cultivation beneath them, for which the island appears well adapted, with such a large number of mature trees.

Concerning *native and foreign fruit trees* any one can observe that wherever the slightest attempt at care or cultivation is made fruit trees respond readily—and amongst these the *Citrus* family takes the first place; all the species, viz. the

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Orange, Lemon, Citron, Lime, Sweet Lime, and Shaddock, are to be found and grow well. The Orange, in its several varieties, is the most cultivated; in the larger estates it is generally planted in rows, and in the smaller shambas scattered amongst other trees. The orange trees are of the very best kind, and include the bitter and sweet varieties.

The tree bears only once in the year, but the annual crop of fruit must be very large.

I understand it was suggested at the period of my visit to open a trade in this fruit with India, by shipping the surplus produce to Bombay. My own experience as regards Southern India hardly favours the proposal, but every effort tending to develop the trade of Zanzibar should certainly be encouraged. Bombay and the more northern coasts of India offer a large field for experiment, and due consideration is to be given to the fact that the oranges ripen at different times in the two countries. If a successful trade were developed, Aden also would offer certain possibilities, with its European garrison and numerous passenger steamers, inward and outward bound, calling at that port.

*Coffea arabica* is cultivated—or more properly exists on the island, it being found in one or two shambas in the Mwera district, but from a planter's point of view, much neglected, being neither topped nor pruned. Under shade it might certainly be cultivated, but never more than to supply local demand. A few trees of Liberian coffee (*Coffea liberica*) were planted by Sir John Kirk in his garden at Mbweni, close to Zanzibar. The trees when seen by me were attacked by *Hemeleia vastatrix*, the leaf disease plague of India and Ceylon, but were otherwise healthy though much neglected. I would not recommend attempting this cultivation on the island, as I consider that more remunerative returns can be obtained from more suitable products.

*The Mulberry* is very plentiful and often used to mark boundaries between estates; the species is the small Indian black variety.

Another minor product is the *Silk-cotton tree* (*Eriodendron anfractuosum*), known locally as "msufi," generally grown in

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the neighbourhood of houses, and its cotton used as a stuffing for pillows. I do not know whether a trade in "kapok" (as the cotton is named) could be fostered in Zanzibar. In Ceylon, Java, and Sumatra, whence it is exported, it does not pay to grow the tree as a separate product, but it is simply scattered about the various plantations and utilized for shade and for boundaries. The principal demand comes from Australia, where the cotton is used in the manufacture of pillows and cushions; Holland and Fiji also import it in a lesser degree.

*Cotton*, although a most suitable product for the mainland, is not so for the islands, where rains often completely spoil the crop.

The *Papaw tree* (*Carica papaya*, L.) generally finds a place amongst cultivated products, the fruit, both green and ripe, being much esteemed as an article of diet. It grows everywhere, any soil appearing to suit it. Reference is here made to it on account of its probable future importance, as from the milky juice of the fruit a new peptonizing agent has been obtained called "papain."

"The experiments of careful observers have shown that 'papin' or 'papain' in concentrated solution, will dissolve more meat fibre or coagulated albumen than will pepsine in the same time."[1]

*Alimentary Plants: The sugar-cane.*—The soil of Zanzibar is well adapted for the growth of the sugar-cane, of which there are many varieties. The industry flourished under Seyyid Barghash, the great Sultan of Zanzibar, and Mr. Fraser cultivated the cane with profit on his Kokotoni plantation, sugar to the value of £3000 being shipped in 1864. I attribute the discontinuance of its cultivation firstly to want of labour, secondly to the cheaper beet, and particularly palm sugars, which are slowly but surely ousting the cane sugars out of the markets.

Sir John Kirk thinks it is owing to the soil and climate, which render it liable to attacks by the beetle *Heteronychus atratus*, but I am inclined to think that it was the unsuit-

[1] *Tropical Agriculturist*, October 1891.

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able variety of cane that was in fault, as exemplified in Jamaica.[1]

The low-lying grounds offer every facility for the extension of this cultivation. Certainly the present position of sugar-cane producing countries is not sufficiently satisfactory to encourage one to speak very hopefully of the prospects of a revival of this industry in the island; but taking into consideration the exceptional geographical position of Zanzibar, I am led to believe that a local trade might be successfully developed with the African mainland. The result of the Commission which has lately inquired into the conditions of the industry in the West Indian colonies may have some influence on its future prospects in Zanzibar.

*Bananas*, one of the most important of the secondary food products, are grown everywhere, either in rows between the coco-nuts and other trees, or as a special crop, and are always found around houses. The numerous plantations of this useful plant add much to the beauty of the landscape of Zanzibar. It grows and yields most luxuriantly; some clumps that I saw in the northern portion of the island were from 18 to 20 feet in height, the circumference of the stems being 3½ to 4 feet one foot above the ground. It thrives best in warm, moist, clayey soil and in an atmosphere strongly impregnated with salt, in both of which respects Zanzibar well meets its requirements. I wish to draw attention to the

[1] Mr. D. Morris, Assistant Director Royal Kew Gardens, speaking of the Jamaica Sugar Industry says: "As one of the most important elements in the improvement of the sugar industry of Jamaica, it is a matter of regret that more attention is not given to the selection of certain varieties of canes, and the special adaptability of such canes to certain conditions of soil, aspect, rain-fall, and climate. Again, in the selection of cane plants it is a question whether the practice which obtains in Jamaica and some of the older sugar-growing countries, of taking cane tops for the season's planting from thrown up or exhausted fields, does not seriously affect the yield and productiveness of estates in this island. This practice, adopted probably in the first instance from motives of economy, is now continued . . . but it is very probable that the continued planting of the immature portion of the sugar-cane in this manner has been in a great measure the cause of its deterioration, and that it has contributed a much larger share than is supposed towards rendering sugar estates less productive than otherwise they might be."

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possibilities of its extended cultivation in connection with the rising demand for *Banana meal* and *fibre*. In the manufacture of the meal I am afraid Zanzibar would have to face the keen competition of the West Indian Islands, so much more advantageously situated. Fifteen pounds of fruit will yield 3 lbs. of prepared flour, and a sample of flour from the *Moko* plantain realized 6*d*. per lb. in London.

*Fibre*.—The question of fibre is more promising. The *Red Banana* yields the best, and 700 plants to the acre would give an annual yield of over half a ton of fibre. A sample of the red banana fibre from Trinidad was valued in 1886 by Messrs. Ide and Christie at £25 per ton. Too close planting should be avoided, 12 feet each way between the plants being found to give the best results.

*Cassava* is the chief ground cultivation and forms the principal article of food. The two varieties—the bitter (*Manihot utilissima*) and the sweet (*Manihot aipi*)—are cultivated, the method employed being extremely simple. Cuttings are merely placed in the newly-holed field or bed at irregular distances, no drills or trenches being made, and six months is the average time from the planting till the digging up of the roots. Newly-planted fields are generally kept very clean, but when once the plants are established, less care is taken. No attempts at the manufacture and export of tapioca (the farinaceous matter of the roots, separated and converted into a kind of starch) have ever been made.

*Arrowroot*.—A variety of this (*Tacca pinnatifida*) is to be found in most native gardens, and is called locally "uwanga"; the roots are washed in repeated waters and finally sun-dried. This preparation mixed with sugar forms a favourite dish of the Arabs. I see no reason why arrowroot should not be extensively cultivated and form an article of export, as the cultivation is easy and immediate returns are obtained. The plants are propagated by parting the roots, and a light loamy soil is the most favourable for their growth.

*Grains*.—As to *rice*, which, notwithstanding all the advantages the island possesses for its cultivation, is actually imported, a great deal more might be grown than is at present the case. Both wet and dry cultivation are to be seen, but a systematic

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irrigation as practised in India and Ceylon is not known, advantage being merely taken of the flooded banks of rivers and the swampy bottoms of low valleys which are so frequently met with in the island. *Maize* (*Zea mais*) does not appear to be extensively cultivated, and where grown is generally combined with dry rice. Of the other grains, particularly the *Millets*, although formerly much land was under *Sorghum vulgare*, very little is cultivated at present, and now grain is chiefly imported from the mainland.

Of the *Ground-nuts* two varieties are found, known locally as "Mjugu nyassa" and "Mjugu mawe." The first (*Arachis hypogæa*) yields the ground-nut oil of commerce, the second is the *Bambarra ground-nut* (*Voandzeia subterranea*), a smaller one used only for food. Hitherto the exports have been trifling, amounting only to Rs. 6284 in 1894.

Its cultivation is comparatively small, and is more particularly confined to the country lying between Dunga and the capital. This is a most profitable crop, the yield being very large, often averaging 100 bushels an acre, and the nuts containing up to 50 per cent. of oil.

Ground-nuts are becoming an important and valuable article of commerce, for which an increased demand has sprung up, more especially at Marseilles. They form one of the principal exports of the eastern districts of the Madras Presidency, and there is no reason whatever why their cultivation in Zanzibar should not be extended. One reason given for the small amount cultivated is that the crop is a very exhausting one, but certainly not more so than cassava, and this objection apparently does not carry great weight with the native cultivators in Southern India. It would certainly be a great step in advance if the profits derived from the exports of this product were to induce landowners to pay greater attention and care to the up-keep of their fields.

Another oil plant is Sim-sim, or "Gingelly." It does not appear to be cultivated to the same extent as on the mainland; oil-plant cultivation appears to take a secondary place in Zanzibar.

*Pepper.*—The Pepper vine is not cultivated. The species growing on the island are varieties of the shrubby *Capsicum*,

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chiefly *C. annuum*, *C. frutescens*, and *C. fastigiatum*, the pulverized fruit pods yielding the cayenne pepper of commerce. These are to be found in a small degree in every shamba, but the principal source from which the annual exports are derived is the eastern side of Zanzibar, where the cultivation is chiefly in the hands of the Wahadinu people.

My visit to this part of the island was too brief to enable me to speak with any certainty as to the actual position and prospects of this spice, but judging from the observations I was able to make, the cultivation struck me as of a very scattered nature, consisting generally of small isolated patches from half to one or two acres in extent combined with tobacco, tomato, pumpkins, etc.

Now as the chilli is, as yet, the only product of any value grown in this less favoured portion of the island, I consider that a little fostering care might be productive of much advantage. It is a cultivation easily carried on, requiring no special trouble or skill, and the returns are certain and profitable. At present the people are so blind to their own interests as to wilfully depreciate its value, and to disguise possible shortage by theft on the way down to Zanzibar, owners actually damp the chillies before despatching them, so that it is often necessary on their reaching the Government Custom godowns to dry them as quickly as possible as the only chance of saving them. I examined some bags that had just arrived, and the heat was so great that they felt quite hot to the hand when inserted.[1]

[1] "The production of chillies has declined from 17,735 frasilas in 1894 to 16,336 frasilas in 1895, a decrease of 46,935 lbs., the smaller demand for this article being probably due to its inferior quality owing to careless picking and drying. The plant receives but little attention from the native, who objects to the slight personal discomfort which he experiences in handling it, the result being that it is allowed to grow almost wild in the eastern and more uncultivated portions of the island, and that only a comparatively small proportion of the pods are picked, and if picked they are but badly dried. If more care was taken with the cultivation and preparation of this useful commodity the produce of Zanzibar would in all probability bear favourable comparison with that of other countries. The average price during 1895 was 2 dollars 33 cents per 1 frasila of 35 lbs. The duty is 10 per cent." (Consul-General's Report for 1895.)

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The exports of chillies during 1894–95 were as follows :—

1894. 5081 packages. Value £6826.
1895. 545,207 lbs. Value £4795.

DYES.—Speaking of *Indigo*, Sir John Kirk remarks "that it is the only vegetable dye that has been manufactured for export in the islands ; the industry has been abandoned for nearly forty years, and the tanks have gone to ruin, but the plant grows wild everywhere."

*Arnotto* (*Bixa orellana*, L.).—This tree—or rather plant, for it rarely exceeds a growth of 8 to 10 feet—is fairly common in most native gardens ; the waxy substance or pulp yields the arnotto of commerce, at one time employed in the dyeing of silk, but now chiefly used in cheese and butter colouring. The trade is so limited that I do not see any advantage from it for Zanzibar.

*Logwood* (*Hæmatoxylon campechianum*), a new product, appears to have adapted itself wonderfully well to the island. The great length of time, ten years, before any commercial use can be made of the tree is, however, its one great drawback.

The *Orchella Weed* (*Roccella tinctoria* and *R. triciformis*), which yields a purple dye, grows in Zanzibar but is more a product of the mainland, though Zanzibar is at present the chief port of shipment.

The *Henna* plant (*Lawsonia inermis*, L.), yielding the well-known orange-red dye so favoured by Orientals, is another naturalized plant.

*Turmeric* (*Curcuma longa*) is grown, but only as a spice.

As regards domestic animals, a question closely connected with cultivation, the scarcity of cattle in the island was very noticeable, the few cows being kept solely for milking purposes ; bullocks I saw only in the town, dragging Government carts. Since my visit, however, a large number of bullocks, cows, etc. have been imported. Madagascar is not far away and produces a good breed of cattle. I may remark here on the slight attention that is paid to manure. Even in the absence of the most fertilizing kind, viz. cattle manure, much might be done by the people in burying all weeds and rubbish in shallow trenches between the coco-nut trees, and utilizing

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ashes, and especially sea-weed, so easily obtained. The benefits of better cultivation of all products need not be enlarged upon. The island possesses excellent nourishing grasses, and large herds of goats are common, goat's milk being largely consumed. Donkeys are much used for riding but very little for transport.

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## CHAPTER VIII

### NEW PRODUCTS SUITABLE FOR CULTIVATION IN ZANZIBAR

Fibres—Cacao—Nutmegs—Cinnamon—Pimento—Pepper Vine—Ginger.

IN discussing the new products suitable for cultivation in Zanzibar, the marked similarity between it and the more important West Indian islands—notably Trinidad and Jamaica—in respect of soil, temperature, and rain-fall (to which I have already drawn attention), is an important and suggestive fact; for with this similarity of soil and climate it naturally follows that the cultivation of the principal tropical products can, with certainty of success, be introduced into the former country; and it will be seen that the island contains great possibilities, only requiring development for their realization.

I propose merely to draw attention to the capabilities of Zanzibar, and to point out the manner in which, to the best of my judgment, they can be most successfully developed.

Amongst the more important of the products, the introduction of which into Zanzibar should prove remunerative, I would specially call attention to the following—

*Fibres*, *Cacao*, the *Nutmeg*, *Cinnamon*, *Pimento*, the *Pepper Vine*, and *Ginger*.

1. The cultivation of FIBRES forms an important question for Zanzibar. The subject deserves detailed consideration, and I accordingly gave the matter particular attention. I was much struck by the results obtained in the Bahamas by the development of the Sisal hemp industry, and think that like results might be achieved in Zanzibar. The Sisal hemp (*Agave rigida*) was introduced into the Bahamas more than half a century ago, was neglected, and became a weed; it was



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reserved to Sir Ambrose Shea, Governor in 1887-8, to give the first impetus to this industry in those islands, with the result that, in 1891 4000 acres were under cultivation, in 1893, 8000 acres, increasing in 1895 to over 25,000 acres.

The export of fibre in 1892 reached 150 to 200 tons, and by 1900 it is expected to reach large dimensions. On comparing the soils of the Bahamas and the Yucatan Province of Mexico, which is the original home of the Sisal hemp, with those of Zanzibar, one sees a marked similarity. In the parts of Yucatan where it is grown the soil is *of a gravelly, stony, and in some places of a rocky nature, the plant thriving best in comparatively arid districts, a few feet above the sea level;* rich and moist soil is unsuitable, for though the plant grows well, the quantity and quality of the fibre is then much poorer. In the Bahamas (which have proved a congenial home to this product) one finds that the majority of the islands have next to no soil, *four-fifths of the surface being bare coral rock, with pockets of soil varying from a few inches to a few feet in depth,* and in this unpromising soil a flourishing industry has been founded and developed, bidding fair to revolutionize the financial position of the islands. Zanzibar, like the Bahamas, has a large unfertile area, also consisting of bare coral rock sparsely covered with soil, and what has been accomplished in the Bahamas can be done in Zanzibar. It is true that prices are no longer what they were,[1] the market value of this fibre having fallen from £56 10*s.* 0*d.* a ton to roughly £14 0*s.* 0*d.* (the price in 1895); but if so, the cost of production is also much less, it being possible with the modern machinery in use to cut and cart the leaves, clean, bale, and ship the fibre at a cost of about 1*d.* per lb. in the Bahamas, the corresponding cost for Manilla and Yucatan being respectively 2*d.* and 1½*d.* per lb.

In the Bahamas returns are expected between the third and fourth year after planting, whilst—as regards yield—from an acre of 600 plants the lowest estimate is half a ton of fibre.

For fuller information I refer the reader to Appendix E.[2]

[1] See Mr. Christie's interesting letter in Appendix B.

[2] The following articles have appeared in the *Kew Bulletin* on Sisal Hemp and Allied Fibres from species of Agave:—1887, March, p. 3,



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Pineapples (*Ananas sativa*), though actually growing wild on the island, are not at present utilized in any way, and may really be described as a new product, so that they are included under that heading. The wild growth of pineapples and aloes suggests the practicability of developing an important trade in the manufacture of fibre from them, for a very large area of the territory of the British Protectorate on the mainland is known to be rich in fibre-producing plants, and there is, in my opinion, the nucleus of an extensive trade in these materials.[1] The manufacture of pineapple fibre is practically an untried industry, though the value of the fibre is admitted, the small quantity now produced coming principally from China. I believe that Professor Edison has directed his attention to the matter of decorticating the fibre by means of a solution of crude petroleum.

2. The CACAO TREE (*Theobroma*, L.) is well adapted for cultivation in the island. In Trinidad the annual export averages over 20,000,000 lbs., and I here quote an interesting passage from Mr. Hart's book on cacao cultivation in that island. The *italics* are my own:—

"In my experience humidity is a much more important feature in plant growth than temperature alone, and no plant

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Sisal hemp (*Agave rigida*, var. *sisalana*); 1887, December, p. 5, Mexican fibre or Istle (*Agave heteracantha*); 1889, March, p. 57, Bahamas hemp (*Agave rigida*, var. *sisalana*); 1889, October, p. 254, Bahamas hemp (*Agave rigida*, var. *sisalana*); 1890, March, p. 50, Bombay aloe fibre (*Agave vivipara*); 1890, July, p. 158, Bahamas hemp; 1890, October, p. 220, Mexican fibre or Istle (*Agave heteracantha*); 1890, December, p. 273, Fibre production in the Caicos; 1891, May and June, p. 133, Keratto fibre (*Agave Morrisii*); 1891, July, p. 175, Bahamas hemp; February, 1892, Sisal hemp.

[1] A sample of pineapple fibre of excellent quality and extraordinary length (6 feet), grown at Malacca, was brought to this country by Mr. Derry in 1893. It was stated, in the *Kew Bulletin* of 1893 (p. 368), that one manufacturer was hopeful of using 1000 tons a year or more of this fibre at the price of £30 per ton, delivered in London. "Pineapple hemp" is a regular article of export from Formosa to Swatow, where it is made into fine "grass cloth," esteemed for its coolness for summer wear.— Mr. D. Morris, Assistant Director of Royal Gardens, Kew, on "Commercial Fibres," 1895.

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suffers more than cocoa at periods when the air is deficient in moisture. Even in the driest weather in Trinidad the hygrometer shows that during the later portion of the night and early morning the moisture in the air closely approaches to saturation, and it is only the readings of the periods between 10 a.m. and 4 p.m. which reduce the record to the average of seventy-eight. Countries in which the annual rain-fall is greater than in Trinidad may not possess the same humidity, and therefore are not so suitable for the cultivation of our plant, *and countries which, on the other hand, exhibit a smaller annual rain-fall, may be more suitable for cocoa cultivation owing to the presence of the requisite amount of humidity; for in no country is the humidity fully determined by or coincident with the rain-fall, as it is often influenced by many other outside conditions.*"

As the subject is an important one, I also annex a table of comparisons of temperature, humidity, and rain-fall between Zanzibar, Trinidad, and Colombo—Ceylon cacao at present realizing the highest prices in the London market.

TABLE OF COMPARISONS

| Country | Temperature | | Temperature Mean | Humidity | Rain-fall | Years of Observation |
|---|---|---|---|---|---|---|
| | Mean Maximum | Mean Minimum | | | | |
| | ° | ° | ° | ° | In. | |
| Zanzibar | 83·7 | 76·4 | 80·3 | 80·3 | 61 ·01 | 5 |
| Trinidad | 86·8 | 69·4 | 78·6 | 79 0 | 71·55 | 4 |
| Colombo | ... | ... | 81·2 | ... | 87·74 | 14—15 |

N.B.—Of Colombo I am only able to quote the mean temperature and rain-fall.

As to soil, "the very best land that can be got should be secured for cocoa; the plant is a deep feeder, and to thrive well must have a good subsoil; dark friable chocolate soil of great depth is the best, but such is comparatively rare. Light soil, with a good deep subsoil, is to be preferred to one with a rich surface soil, but hard, impenetrable subsoil. Very steep land

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is to be avoided, but moderately steep suits very well; rich flats are the best."[1]

Shading for the first four or five years is necessary, and for this purpose there are many suitable trees, for although heavy shading is not required when once the plant is well established, still light flickering shade is very beneficial; and amongst other shading trees may be mentioned the *Grevillea robusta*, the tree known in Trinidad as "madre de cacao"; *Ficus glomerata;* and the *Albizzia stipulata* (used for shading tea in Assam). But for first shading nothing can equal bananas. "The banana used for shade," says Mr. Hart, "is usually planted intermediately between permanent rows of cocoa. If cocoa is at 15 feet, then banana 7½ feet, and so on."

Mr. D. Morris, Assistant Director at Kew, in speaking of cacao cultivation in Jamaica, says:—"Some years ago we thought the chocolate industry had almost died out in Jamaica. It had been so neglected that, except in some few places, no cocoa trees were left. Then the endeavour was made to revive the industry. There is not the slightest difficulty in establishing a cocoa estate; you already have your banana shading; all that is left to do is to raise the plants and put them under the shade of the bananas. The cocoa trees only require to be carefully planted and pruned, all the shoots removed, and the trees encouraged to send out their bearing branches so that the pods borne on the stem of the plant may have plenty of space, light, and air."

The above applies with equal force to Zanzibar; here also bananas are plentiful, and the fertile areas, extending especially through the centre of the island, are, in my opinion, excellently adapted for the cultivation of this valuable tree. The spaces between rows of clove trees might also be planted with cacao, and once its adaptability had been conclusively proved, the clove trees might be cut down and the area of their cultivation more equalized with that of other products less precarious in value, as well as less exacting in respect of labour and attention.

Cacao seeds soon lose their vitality, and it would be

[1] *Cocoa Cultivation in Ceylon*, by W. Jardine.

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necessary to introduce the cultivation either by means of young plants brought over in Wardian cases, or else, as originally suggested by me to the Directors of the Imperial British East Africa Company, the pods might be carried from Ceylon as far as possible and then broken, the seeds being then placed to germinate amongst refuse coir, and on arrival immediately planted out. The seeds and plants should be procured from Ceylon on account of its proximity and the higher prices it commands.

3. The NUTMEG TREE (*Myristica moschata*) is another product which should prove a valuable accession, the soil of the island being also suitable for its cultivation. The comparatively long interval that must elapse before returns can be expected—seven to nine years—must always tend to restrict its cultivation, and maintain the present high prices.

"A strong, rich, and rather moist loam is the most favourable to nutmegs, as when planted on a sandy soil the trees are not nearly so productive."[1] In a report on the cultivation of spices in Bencoolen, Sumatra, it is said that "the soil throughout the plantations generally is a red mould, with stony fragments or pebbles frequently intermixed with it, the surface of it in the forest alluvial and low lands being of a chocolate colour varying in depth from 3 inches to 10 and 12 inches."

4. The CINNAMON TREE (*Cinnamomum zeylanicum*) is well suited for cultivation in the sandy soil which is a frequent characteristic of Zanzibar Island, though present prices are not encouraging:—

"The quality of the soil is a most important feature in the cultivation of cinnamon: a dry, sandy soil, which would be inimical to the successful growth of most trees, being an essential condition of success in this case. Not only is the general growth of the tree beneficially influenced by a silicious soil, but the quality and early maturity of the bark produced under these conditions is superior to that of trees grown in hard, stiff, or wet soil. Grown under favourable conditions, the trees can be made to yield their first product in five years, but in wet or heavy soils, or in shaded situations, not only are

[1] Porter's *Tropical Agriculturist.*

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the trees longer in maturing, but the quality of the bark is never so good."[1]

5. PIMENTO (*Pimenta officinalis*) is another minor product well adapted for cultivation in Zanzibar, as it grows well on all soils suitable to the clove tree; it is a native of the West Indies, and particularly plentiful in Jamaica, where the soil is of a stiff red or brown clay, very similar to that of Zanzibar.

It was long supposed that the pimento tree could not be established successfully outside its native habitat, but later experience has disproved this. It is found in Ceylon, where in recent years some attention has been paid to its cultivation. It has also been introduced into Queensland, and there is a tree now growing in Mbweni shamba in Zanzibar, probably introduced by Sir John Kirk, from the seeds of which one could propagate it, for they are difficult to import and of a very perishable nature.

Owing to the large annual export of "Pimento walking-sticks," which are supplied by cutting down young shoots, the yield and export of the "allspice berries" from many parts of the world is greatly reduced, so the cultivation of pimento merits all the more careful attention in new localities.

6. PEPPER (*Piper nigrum*) I think would do well in Zanzibar, the only doubt being the question of rain-fall. The Pepper Vine, though hardy and capable of growing in most soils, requires above all a heavy and evenly distributed rain-fall —still, taking into consideration the suitability of soil and the excellent shade facilities afforded by the numerous mango and jack trees abounding everywhere, I consider the experiment is well worth attempting, and if successful would add a most valuable product to the other resources of Zanzibar.

Until proved successful I would advise trying the method practised by small cultivators in Malabar.

"A red gravelly soil capable of retaining moisture with a goodly number of mango and jack trees growing on it is preferred. The mango tree is reckoned the best for the purpose. A mango tree ought to be at least twenty years

[1] *Cultural Industries for Queensland*, "Cinnamon Cultivation." A. M. and J. Ferguson.

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old before any pepper vines are put upon it; for it is believed that a younger tree will produce less fruit when there is vine upon it than it otherwise would do. At the commencement of the rainy season, which is the south-west monsoon in Malabar, the soil round the tree is dug, and a small bank, at a cubit distance from the root, is formed to confine water. Then from eight to twelve shoots of the vine, according to the size of the tree, are laid down within the bank with three inches of the vine slanting up against the tree. The shoots are about a cubit long. They are then covered with fine mould and earth. As the vines grow they must be tied up to the tree. In the hot season they require watering. At the commencement of the rainy season, leaves, ashes, dung, etc. must be put near their roots and fresh earth thrown up. The pepper vine begins to bear at five years of age. In four years more it is in full bearing. An ordinary tree will produce 20 lbs. of pepper and a good one 30 lbs." [1]

7. GINGER (*Zingiber officinalis*) is a useful spice, the cultivation of which could also with advantage be introduced into Zanzibar.

The chief commercial varieties are obtained from the East and West Indies (Jamaica), and the West Coast of Africa (Sierra Leone), the scraped ginger being the most valuable.

"The plant is cultivated with little trouble in tropical regions, very much in the same manner as potatoes are propagated in England. After the ground has been well cleansed and trenched the planting commences in March and April. Holes are made, about 4 inches deep and 6 inches asunder, into each of which a small piece of the root is put and then covered over with earth. In a few months the whole ground will be overrun with plant. The stalks begin to wither in the January or February following, and then the roots are in a fit state to be dug up. A sandy soil, and land not having been previously cultivated, are unfavourable to this crop, but under propitious circumstances ginger yields a very large return." [2]

[1] Pepper cultivation in Malabar, India, from Messrs. A. M. and J. Ferguson's "Spice Cultivation."

[2] Porter's *Tropical Agriculturist*.

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Concerning Vanilla, although the plant is found in Zanzibar, I consider its cultivation more suitable to Pemba Island.

As to the prospects of Indiarubber cultivation, although the specimens of South American rubber trees introduced by Sir John Kirk at Mbweni have taken very kindly to their new surroundings, the Ceara trees especially so, yet I do not consider that this industry would prove remunerative in Zanzibar, and for these reasons—First, that in order to obtain remunerative returns, extensive areas must be planted; whilst the Ceara species (*Manihot Glaziovii*), which, from its hardy nature and capability of thriving in stony barren regions, might at first sight be considered most suitable for cultivation in the less fertile lands on the eastern and southern coasts of the island, would not answer, as the wild pigs would prove too destructive to its cultivation by grubbing up and eating the tubers, of which they are very fond. In many districts of Southern India its cultivation had to be given up for this reason alone.—Secondly, the greater part of the British Protectorate on the mainland is so eminently adapted for its growth and cultivation, that in my opinion it has a more certain prospect of future development in that region, with which Zanzibar could not compete with profit.

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## CHAPTER IX

### TOUR IN PEMBA ISLAND

Points needing Investigation—Arrival at Weti—Arab Name for the Island—Exuberance of the Vegetation—An Arab Proprietor—Undulating Country—Uncultivated Land—Fine Clove Trees—Narrow Creeks—Mohamed bin Jumah and his Shambas—Coffee Trees.

I LEFT Zanzibar on April 2, 1892, for a tour in Pemba Island, in order to make a general report on its products and capabilities, on behalf of the Zanzibar Government.

The steamer *Kilwa* being ready to start, I sent my porters and kit on board; General Mathews courteously taking me later in his boat and introducing me to the Liwali of Weti, who was also a passenger on board, and to whom I handed my introductory letter from the Sultan. My intention was to land at Weti on the northern part of the island, and make that my head-quarters. The Liwali was an old friend of General Mathews, and promised to give me every help and assistance in his power.

My instructions, apart from observing the products, mode of cultivation, and soils of the island, were more particularly to obtain information on the following points:—

1. The reasons for the difference in value between Pemba and Zanzibar *copra*, the former being inferior, and generally of a very black colour, and being thought to be *kiln-dried*, instead of sun-dried, as stated to be.

2. The reason of the smallness of the clove crop in the north of Pemba this season, as compared with last year—the crop in the south of the island being up to the average, and with no signs of falling off in the exports.



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3. Whether dried cloves are smoked, and if the mode of curing the buds is the same as in Zanzibar.

4. Whether clove trees grow best on sides of ridges, or flat land, and what are the most favourable soils, etc.

5. State of rice cultivation.

6. Whether ground-nuts are cultivated.

7. The cultivation of nutmegs, capsicums, and the pepper vine (*Piper nigrum*).

After a calm passage, we arrived at Chaki Chaki at 6 p.m., and anchored for the night, and next morning at daylight we steamed to Weti, where H.M.S. *Blanche* was at anchor in the harbour. I immediately went ashore, accompanied by the Liwali, who was most polite; he offered me a house in the town, but as it looked hot and stuffy, I preferred my tent and had it pitched under a large zimberao tree outside the town. Weti, well situated at the end of a long, deep and well-protected creek, is a small town, inhabited by many Indian traders, and entirely surrounded by clove and other shambas. The appearance of the surrounding country is very broken, undulating low hills traversing it in every direction.

Pemba Island lies 40 miles north of Zanzibar. It forms one of the line of coralline islands lying along the eastern coast of Africa, and is divided from the mainland by a channel from 20 to 30 miles wide.

The Arabs call the island "Al-Hathera" (the green), which its luxuriant appearance amply justifies. Pemba extends in a N.N.E. and S.S.W. direction for 38 miles, and is about 13 miles broad, comprising an area of about 380 square miles. It is fringed on its western side by coral reefs, which shelter the numerous creeks on that coast, where the principal ports and harbours are situated, this being the most cultivated and inhabited part of the island. The surface of the country, with its broken ridges and low valleys, luxuriantly covered with vegetation, nowhere exceeds 300 feet above sea level.

My first day being Sunday was chiefly spent in settling down in my camp, making arrangements for visiting various parts of the island, and inquiring for suitable guides. Frequent heavy downpours occurred through the day.

I had been much impressed so far with the exuberantly rich

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vegetation everywhere, even more luxuriant than in Zanzibar. This certainly indicates a greater rain-fall. The clove trees round about were larger and finer than those in Zanzibar, and the mango trees grew down almost to the water's edge. As to the *soil*, I noticed that in the steep bank I ascended on my way to the town on first landing, wherever wash had exposed it, the sides and lower layers consisted of a yellow to red clay subsoil, with a substratum of yellow to white sandstone, whilst the surface soil was generally a black to grey friable loam. The results of my inquiries showed that the pepper vine is not cultivated in the island, black pepper being imported by the Banians or Indian traders, who retail it in the bazaars.

In the evening I was visited by the Liwali's brother, several influential Arabs and many Indian merchants, and early next morning I received a long visit from the Liwali. We had a long and interesting conversation on many topics, and amongst other information he confirmed all I had been told yesterday as to the pepper vine and nutmeg not being cultivated. Cultivation in general is carried on much on the same lines as in Zanzibar, cloves being the principal product.

Shortly after the Liwali's departure I started on my first tour of inspection, taking first the country to the north of Weti, in company with the owner, Sultan bin Mohamed bin Nasur. The field cultivation in the neighbourhood of the town consists principally of sweet cassava (*Manihot aipi*), intermixed with beans and congo pea (*Cajanus indicus*), the soil being of a grey to black friable loam with a subsoil of stiff yellow to red clay.

Passing through a clove shamba, I was struck with the size and appearance of the trees, which grew thick and dense and completely shaded the ground, no weeds or grass growing underneath them; they were somewhat irregularly planted, being on an average 25 feet apart, and appeared much too close, for the trees in their search for light had shot up tall and lanky, often to a height of 50 to 60 feet. All the buds being on the tips of the branches, the result is that the trees are not so productive as they otherwise would be. They had constantly to cut them down here and there to admit light

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and air. I measured a two-stemmed tree, each stem being 3 feet 8 inches in circumference. Further on I passed several shambas where the clove trees had had to be cut down for the above reason. There was an enormous clove tree at a place called M'Goli, which used to yield seven frasilas of *dried* cloves, and two men with extended arms could not span it. I found the cultivated products growing in the same mixed style as in Zanzibar; thin lanky coco-nuts growing in twos and threes and in small clumps, groups of fine mangoes, with a good deal of cassava and small clumps of pineapples. The soil all around here (north of Weti) was a grey sandy loam.

The clove trees in the same district were all in small groups, and about fifty to fifty-five years old. The difference in size and appearance of the clove trees here and in Zanzibar was very noticeable, as the Pemba trees (except in the south part of the island) escaped the destructive hurricane of 1872.

As I proceeded, there were scattered houses with clumps of bananas, numerous mangoes and many orange trees; and up to this point there had been more shade than open ground. The difference of soil in the open ground, and in the shade, was also observable; in the former it was found to be extremely light-coloured and sandy, and in the latter dark-coloured loam, remarkably friable and porous.

I halted at Chosini shamba, the house of which is situated on and facing the creek, and is a very noticeable object from the harbour of Weti; some fine Kapok or silk-cotton trees grow on the grounds which slope to the water's edge.

To summarize, the country traversed so far was very undulating in character, with small low valleys often with an abrupt descent. In the bottoms one generally saw wild oil palms (*Elæis guineensis*) growing, and everywhere most luxuriant vegetation of grass and bush, as in Zanzibar. Much of the ground appears uncultivated, and this wild vegetation abounds everywhere, excepting on the reclaimed land round the houses. The cloves noticed so far were either growing in detached groups or else scattered about in a closely-planted mixture of coco-nut, mango trees, etc. In favoured situations clove trees densely shade the ground, and few trees have

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single stems, but they usually shoot up with two, three, and often four or five stems. The shade is so dense that the clove buds are not dried under the trees, as in Zanzibar, but spread out in specially reserved open places, which (partly with a view to prevent theft) are generally in front of houses.

I noticed here and there small heaps of coco-nut husks thrown away as useless; no coir rope whatever is made, all being imported from Zanzibar. Pemba coco-nut trees (the dwarf variety) were planted close to the houses.

I remained at Chosini shamba for nearly an hour, Sultan bin Mohamed bin Nasur being most polite, and giving me coffee, sherbet, etc., and volunteering me much information concerning clove cultivation. After quitting this shamba I continued on my way till I struck the creek on the other side of the small peninsula on which Weti is placed, the distance from shore to shore being only half-an-hour. Descending to the water's edge by a narrow path between high banks, I observed the surface soil to be a stiff black loam, the subsoil clayey (yellow), with substratum of yellow to white sandstone. Sultan bin Mohamed informed me that where this substratum of sandstone cropped up close to the surface, the ground was unsuitable for cloves, or indeed any cultivation.

I returned by another way, chiefly through dense mango shade cultivation; then, after passing a good many banana clumps, I came upon another fine clove plantation in a hollow—the soil being black to grey sandy loam, with a subsoil yellow to red clay. The ages of the trees were not known. I may add that I always found it a very difficult matter to ascertain the age of clove trees; no interest seems to be taken in this question, the invariable answer being, "those who planted them know." Coco-nut trees were scattered amongst the cloves, the average planting distance of the latter being 25 to 25½ and 26 feet. As in Zanzibar, the people did not know why coco-nut trees were planted amongst the cloves; they said "it was the custom," and had always been done!

Round the sides of the hollow, the black surface loam was washed away, exposing the red clay subsoil mixed with sandstone. The depth of the surface loam was various, averaging

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perhaps 6 inches. Further on I passed through more fine clumps of mango and jack trees, thickly planted and quite shading the ground. Below these there was a good deal of banana cultivation, and beyond another fine plantation of clove trees, large and small, mixed up with lanky coco-nuts. One single-stemmed clove tree that I measured was 50 feet high, and 6 feet in circumference. To pick a tree like this takes six men a whole day, and such trees will yield from 3½ to 4 frasilas of green cloves—1 frasila of the green being equal to half a frasila of dried cloves. All the trees here averaged fully 4 to 4½ feet in circumference, and their spread of foliage from extreme end to end of the branches was exactly 25 feet. These fine trees quite shaded the ground, their foliage mingling; the height of the first branch from the ground was from 4½ to 5 feet. Some, like the one I measured, had single stems, but the majority had several, and they varied in height from 50 feet to 55, 60, and in special instances 70 feet. The very large size of the trees especially struck me. They appear at first to be more closely planted than they really are—more closely than in Zanzibar—but this is not actually the case: it is only their large size, and the fact of their branches meeting and causing the consequent dense shade, which at first conveys that impression. Under the larger trees the shade is so dense that neither grass nor weeds grow—the ground being quite covered with a thick layer of fallen clove leaves. The soil was sandy grey to black loam, very friable.

The land here still consisted of a succession of low ridges and hollows, being a great contrast to Zanzibar with its stretches of flat country.

On my way back I passed some clumps of a species of *Amomum* very much resembling wild cardamoms, growing in a damp situation on uncleared land. Heavy showers fell during the afternoon after my return to camp, making things unpleasant and damp inside my tent, so I sat outside between the showers, though my comfort was disturbed by the constantly falling fruit of the zimberao tree, which, being ripe, exploded on falling and bespattered one's clothes and stained everything they splashed a dark red colour. More rain was

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said to fall in Pemba than in Zanzibar, and more at Chaki Chaki than at Weti, thus confirming my previous surmise, but as no Europeans have resided in the island no recorded observations exist.

The next day I had a very good guide provided by the Liwali, a man well acquainted with the country and its cultivation, and I started at about 7 a.m. going *south*.

After passing clove trees, large and small, close to Weti town, we came upon open country with the usual bush and grass, as well as scattered mango trees and a good deal of cassava cultivation. The sea on the other side of this tract runs inland, forming a long, narrow creek, characteristic of the western side of the island and running almost parallel with Weti creek. The distance between the two creeks is only about fifteen minutes' walk. The opposite side of the creek was low hilly ground, well cultivated, and very undulating. Then the path passed through a hollow, and I noticed one place where the earth had been washed away to a depth of 4 or 5 feet. There the surface soil was of a grey to black sandy loam, the subsoil red and yellowish clay, with a substratum of sandstone very disintegrated and porous.

The path then led through clove plantations, chiefly young trees, very neglected and overgrown with grass and bush, next through a small village, surrounded by areca-nut palms, bananas, and clumps of coco-nut trees, and some fine mangoes. Silk-cotton trees here became more frequent. I specially noticed one large tree, with a circumference of 5 to 6 feet round the stem, and fully 70 feet high. The soil everywhere was a grey to black sandy loam, light and white in the open country but darker under shade. Further on the appearance of the country improved; coco-nuts became more numerous, but still very lanky, being planted too closely together.

On my left was a deep hollow thickly planted with cloves and coco-nut trees, then small scattered plantations of the former intermixed with bananas, mango trees, and cassava patches. The cassava in places was very fine, being over 6 and 7 feet in height. The country was still very undulating, and as I proceeded I obtained a distant view, on the left, of a ridge thickly covered with cloves, and in the intervening



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valley, lying close below the path, I noticed jack trees, some of which had been burnt when the bush was cleared. The indigenous fruit trees struck me as larger and more luxuriant here—perhaps because they were few and far apart, and therefore more fully developed.

Proceeding next over a flat plain, mangoes and coco-nuts becoming fewer and more scattered, I passed through much uncleared land with occasional fine fields of cassava, which appears to be more extensively cultivated in Pemba than in Zanzibar. The pathway now led down into a valley, the soil on its northern side being stiff black to grey loam, and on its southern side yellow clay, its surface loam evidently having been washed away by the floods of the river which flowed through the centre of the valley. The stream was about 5 feet wide and had its banks fringed with the large-leaved variety of water lily, so familiar along the water-courses of Zanzibar. A little rice was growing, but much more could be grown in this valley, which is fairly extensive and well adapted for its cultivation.

Much of the land was uncleared, indeed cultivation seems to be carried on only in the immediate neighbourhood of houses.

Crossing the river, I climbed to the top of a steep ridge, about 300 feet high, its summit thickly planted with clove trees. The upper layer of the soil had been completely washed away, exposing the red and yellow clay of the subsoil with gravelly sandstone beneath. This ridge, as well as the valley I had just traversed, was the property of Mohamed bin Jumah bin Said (bin means "son of"), an enterprising and intelligent Arab gentleman, one of the richest and most influential landowners on the island. I went into his "baraza" (or place of assembly), which was a large stone building—the largest I had seen in Pemba. After some conversation, and having learnt the object of my visit, Mohamed personally conducted me through his clove plantations. The trees were very large and many-stemmed, about sixty years old, and planted at distances of 29 by 33 feet. The soil was generally light friable sandy loam, and the subsoil red clay. On the southern side there was a hollow, surrounded by small ridges, all thickly planted with fine clove trees.

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I noticed a few trees of Arabian coffee growing near the house. They were looking very healthy, with no trace of leaf disease, and were bearing fruit, whilst young seedlings were growing beneath. I was also shown a vanilla vine, which Mohamed bin Jumah told me he had obtained from the French priests at Zanzibar, afterwards discovering that it grew on the island. He also took me to see his small experimental plantation situated in a hollow. Not knowing any better, he had planted the vanilla cuttings in the open at the foot of stakes about 6 feet high. In that situation, I told him, they would soon die for want of shade. He promised to send a man to guide me to the place where he had found the wild vanilla, and in return I gave him some needful information as to its cultivation, also promising to ask General Mathews to obtain for him particulars from the French missionaries at Bagamoyo, as to the vanilla cultivation carried on there. Mohamed accompanied me back to Weti, having courteously placed two donkeys at my disposal for myself and interpreter. After he had called on the Liwali he came back to my tent, where we had a long talk on a variety of topics, and amongst other things he told me that the Arabs consider Pemba the best island for the cultivation of cloves, and Zanzibar the best for coco-nuts.

The soil of the hilly and broken country which I had gone over this day was in some places a stiff black to dark grey loam, but in others the black upper soil was very thin, and wherever holes had been dug the earth was generally mixed with the yellow clay subsoil, the substratum being always of porous sandstone.

So far I had not seen any "ilook" grass.

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## CHAPTER X

### TOUR IN PEMBA ISLAND—*continued*

The Sea-shore near Weti—Cross Weti Creek—Coco-nut Groves—Extensive Cultivation—Cassava—A Considerable River—Drenching Rain—Witchcraft—Wild Vanilla—Swampy Valleys—Hilly Country—Great Extent of Clove Shambas—Need of Drainage—Complete my Inspection.

THE morning of my third day in Pemba (April 6) commenced with heavy rain, which with short intervals lasted throughout the day. My plans for this morning were to visit the small peninsula south of Weti creek. Whilst waiting for my guide, I strolled down to the sea-shore, which is here fringed with belts of thick mangroves. The banks along the shore are about 8 feet high, and are composed of a light to darker yellow sandstone, and covered with thick vegetation. I did not see any coral. My guide having arrived, we, that is myself, guide, and interpreter, embarked in a small, fragile canoe and started for the opposite shore. We had a most exciting passage across, for we experienced some heavy squalls of wind and rain, and more than once were nearly swamped ; we had eventually to wade ashore through shallow water amidst a belt of thick mangroves. The banks on this side were very high, their composition being of yellow sandstone, in places cropping out on the surface. Climbing to the top of the bank, which was difficult owing to the slippery nature of the ground and the numerous rivulets caused by the heavy rain, I found the same characteristics of soil as on the opposite creek, viz. black to grey surface loam and a



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yellow clay subsoil. The sides of the banks were covered with exuberant vegetation, lovely ferns and mango trees actually flourishing to the very edge, notwithstanding their closeness to the sea.

Beyond these mango trees I emerged into a fine cultivated area—cassava and clumps of mango and coco-nut trees growing closely together, the coco-nut with an unusually decided bend in the stem. In the open the soil was a sandy grey loam. In a plantation which I now entered I was again struck with the large and fine appearance of the trees, and also their too great proximity to each other; their lowest branches in many cases were 10 and 12 feet from the ground. This plantation, called "Kidunda Uchowi," was the property of Said bin Hamisi bin Said, brother of Mohamed bin Jumah, also a large and influential landowner here. From this shamba I passed through mixed cultivation, noticing many fine mango trees, their large spreading branches offering excellent facilities for shade cultivation. Coco-nuts abound here, and two trees that I measured at random are samples of their size. One was 4 feet in circumference, 2 feet from the ground, the other 4 feet 2 inches at 3 feet from the base of the stem. In general they are tall and lanky, tapering to a great height and usually with the decided curve in the stem already described; a few trees had two stems from one base. The path now wound up-hill, giving me a glimpse of a fine coco-nut grove in a valley on my right; the country all around me appeared fairly well cultivated, chiefly with clove and coco-nut trees, though there was much uncleared land to be seen. I continued along the top of the ridge (the soil being of a rich deep red to chocolate loam) and entered a large clove plantation intermixed with coco-nuts, the ground beneath very weedy. This plantation covered the whole of one hill and part of another, and must have belonged to several owners; all vacancies I noticed had been carefully supplied with young plants. Crossing the intervening low valley between the ridges, where an oil palm was growing in a muddy red clay soil with the usual yellow sandstone substratum, I went up the other side, the soil on the side of the ridge being a bright red stiff clay, the upper surface loam having been all washed

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away. On the top of this second ridge the surface loam was dark, the subsoil red as before. The depth of the surface soil varies considerably, from a few inches to as much as 1 foot, and it is in the richer and more fertile parts that houses are most numerous.

Here the country was all under cultivation, groves of coco-nut and mango trees growing everywhere, whilst both sides of the path were lined with numerous young and old clove trees, and there were occasional open spaces planted with bananas and cassava, chiefly the sweet variety. In one of these open spaces called "Umbage" I remarked some very fine silk-cotton trees. I constantly passed heaps of coco-nut husks, thrown away as useless rubbish. The richness of the vegetation increased as I proceeded, the growth of the bush and grass being kept in check by the shade of the many large mango, jack, orange and clove trees, whilst banana and cassava patches were numerous. As I penetrated further into the interior of the island, cloves gave place to coco-nuts. The soil varied from a rich dark grey friable loam to, in places, more consistent chocolate to red clay.

In the open flat places a great deal of cassava seemed to be grown, these open spaces being everywhere surrounded by groves of coco-nut trees of a much more vigorous and healthy appearance than those nearer the coast. Some scattered but small clove cultivation was visible, and mango trees were large and luxuriant. Rank grass and bush grew everywhere with but few attempts at clearing, the prevalent growth being a small grass with short broad blades. Further inland the broken nature of the country continued, the chief cultivation being very fine cassava, but, more often than not, unweeded. Around the houses grew bananas, Congo pea, and coco-nut and mango trees. There was a great deal of uncleared land. The soil everywhere was very rich, chiefly black to dark grey sandy loam, whiter in places. Occasionally patches of ferns and bracken were to be seen, and sometimes isolated clove plantations; but as the country became more broken, cultivation ceased.

After passing over several ridges and through the intervening small valleys, which generally contained water, I presently

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crossed a fairly large river flowing through an uncultivated valley admirably suitable for rice cultivation. Crossing the river I passed over a succession of uncultivated ridges, although the small mango trees scattered about showed that at one time cultivation had existed there. The soil varied from grey to black loam, with always a subsoil of clay, and here and there an outcrop of sandstone. Many of the valleys that I saw were well adapted for rice cultivation. In the large valley which I next entered, all overgrown with grass and quite uncultivated, I noticed groups of a variety of palm, called in Swahili "Miwale" or "Mwale," growing round a swamp in the centre. The soil was a rich black loam. On the right this valley was bordered by a clove plantation called "Kitambu," also the property of Said bin Hamisi; the soil here being a red loam. On a slight ridge beyond one or two Borassus palms were growing. This palm is scarce in this part of the island, though it is numerous around Chaki Chaki.

On the top of a hill, reached by climbing up a bare ridge, was situated the house of Said bin Hamisi, upon whom I called. On leaving, in a drenching rain, I descended the hill again, and crossing a very muddy mangrove swamp, climbed up the ridge on the other side, where I noticed some fine aloes (*Furcræa*) growing. The soil on the side of the ridge was chiefly stiff yellow clay. On descending this ridge I entered an uncultivated valley, all grass and bush, and saw a good many "Mikindu" palms (*Encephalartos* sp.), much resembling sago palms, from the leaves of which fine mats are made. After this I went over and down another ridge with a very slippery descent (for it continued to pour with rain all the time), and through another very extensive mangrove swamp called "Mitopalchi." Then across another ridge, passing more aloes, through another valley partly cultivated with rice, and after this through a third mangrove swamp, succeeded by gently rising ground, all uncultivated, where I noticed for the first time "ilook" grass. I was, however, approaching cultivation again, for from the top of this last ridge I saw the property of Mohamed bin Jumah on the right-hand side.

On this excursion I had gone over a considerable area of

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country, extending in fact to the eastern coast of the island. On my way home I noticed a fine cinnamon tree near the town growing in front of a house.

Rain still continued to fall heavily, and in the evening, writing being impossible, I had a conversation with Masud, my interpreter, concerning witchcraft and sorcery, the belief in which appears to be very prevalent; he gave me the following information on the subject. He said that the Swahili believed that Mombasa people bewitched Zanzibaris on coming over to the mainland, because they were jealous of them. A man wishing to become a wizard, or a woman desiring to become a witch, has to sacrifice a son or daughter, or any near relative, and eat the body with the wizards or witches, after which ceremony admission to the secrets of the craft is granted.

The witch or sorcerer puts a piece of wood into the bed, in place of the victim whose body they have removed by their spells, and gives it the appearance and voice of the slain one, the piece of wood being eventually buried by the relatives under the belief that it is really the body of the victim, who, they think, has sickened and died.

The next morning (April 7) was still showery. Fully five inches of rain must have fallen during the night.

In the afternoon I started on a donkey kindly sent by Mohamed bin Jumah to take me to his house, whence we were to visit the place where he had seen the wild vanilla growing. We proceeded along the ridge, through his handsome and cleanly-kept plantations, obtaining glimpses of low valleys on the eastern side. All the surrounding ridges were covered with clove trees, the whole the property of Mohamed bin Jumah.

The sides of the valley were clothed with rich, thick vegetation, amongst which there were many oil palms—generally found in low, moist situations. We then went down a very steep path, passing through a large clump of pineapples, all growing in one thick mass, and all round us dense, exuberant vegetation, fine trees and masses of ferns. The soil was yellow clay.

At the bottom lay a low, narrow, swampy valley, and the

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character of the surrounding vegetation—the *Amomum* plants, ferns, trees, etc.—reminded me strongly of India or Ceylon. It was altogether a lovely tropical scene. The middle of this valley was about knee-deep in water, in which luxuriant aquatic grass and shrubs were growing. I waded through this, following the course of the valley, and after passing through a deeper swamp or morass (the soil everywhere a rich loamy black), the valley narrowed, being hemmed in on all sides by low hills covered with large trees and the richest vegetation. We then emerged into a smaller valley, also swampy, and covered with dense vegetation, amongst which were growing many forest trees with fine straight boles, and clinging to these, hanging down from the branches and straggling over the ground, was the vanilla plant. I noticed that the roots grew under the very deepest shade of the undergrowth. The plants were most luxuriant, climbing about in every direction.

We returned by a different route, through another swampy valley, which had been cleared for rice and divided into tiny sections with little "bunds," reminding one of a miniature Indian rice-field, and showing what could be done in this way in the numerous valleys of this island. The country around presented the usual aspect—low undulating hills and deep valleys clothed with the richest vegetation; the latter generally containing water. After ascending two low hills we got back again to Mohamed bin Jumah's house, passing through a different part of his large clove plantation on the way. This plantation was certainly one of the finest I had seen. I took the trees to be about sixty years of age, and some of them were very large. They were planted much wider apart than on the northern face, the distances being 25 and 36 feet, and even then the top branches of the trees almost met. The average height of the trees must have been over 50 feet. Looking down the regular lines they presented a series of beautiful shady avenues whichever way one looked. Certainly there are few scenes more beautiful than that of a well-kept and mature clove plantation.

I noticed, however, many trees which needed pruning. I called Mohamed's attention to them, but his great fear was that any damage should be done to the branches; and for that

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reason he would not employ hired labourers,[1] who would not be so careful as his own slaves.

At my suggestion, Mohamed bin Jumah was going to try to grow some vanilla on trellis-work in the centre of some of his rows of clove trees, where the larger trees shade the ground; and he showed me some holes he had already dug. The results of this experiment should be interesting, because, if successful, it would afford shamba owners another means of utilizing their clove plantations, should the value of this spice go on decreasing, or its profitable cultivation be from any other cause made more difficult. Eventually, the vanilla plants might even be trained on the clove trees themselves, though whether this experiment would succeed is an open question, for the vanilla is a parasite, and although growing from the ground is chiefly an aërial feeder, depending much upon the tree which supports it for its nourishment.

The soil of this plantation is a fine, rich, dark loam, with red to yellow clay subsoil, and the ground is constantly enriched by the humus formed from the constantly falling and decaying leaves; this goes on all over the island.

On my return I took an opportunity of measuring the cinnamon tree I had noticed the day before; it was a fine, healthy specimen, nearly 4 feet in circumference near the ground and the same girth 5 feet higher up the stem.

I understand that stone for building purposes is very dear in Pemba, one donkey load of coral costing a rupee, and consequently only the richest people possess stone houses. It struck me that it might be practicable and profitable to ship coral-stone from Zanzibar as ballast, bringing back a cargo of dry coco-nuts.

On April 8, the fifth and last day of my visit to Pemba, I started in the morning to inspect the country to the E.N.E. of Weti. After walking for some distance through a large plantation belonging to Sheik bin Ali bin Nasur, the clove trees of which were very large, I entered, beyond a large village, the extensive clove plantation of "Kisimbani," the

[1] For gathering cloves. But Mohamed was a rich man, with plenty of slaves, and thus quite independent of hired labour. Smaller men had no option.

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property of Sultan Mohamed. The lay of the land was very hilly, the soil on the top of the ridges being a black loam, but this upper loam was usually washed away, exposing the subsoil and showing great want of drainage.

Kisimbani plantation was of considerable extent, containing very fine, luxuriant trees, originally planted 28 by 17 feet apart, but every other row had to be cut down to admit more light. I observed that the cloves were generally planted on ridges or slopes, seldom in hollows, which as a rule are left uncultivated. The soil in this shamba was a black to grey loam of a depth of 1½ feet, with the usual clay subsoil beneath.

Here coco-nut trees were planted only amongst the cloves. On the top of the ridge the trees were very poor and lanky, with yellow foliage, and some appeared to be dying; the reason probably was that the substratum was too close to the surface. Further on the soil improved.

After going through another clove shamba the path emerged into uncultivated country, passing some hollows where oil palms were growing. The country was very hilly. No rice was grown here, the cultivation being chiefly cloves and cassava. Proceeding across an undulating country I noticed on the way a great many pineapples growing about. The frequent valleys, the descents into which were generally extremely steep, mostly contained water, and in some of the hollows there were fine timber trees.

Travelling along a continuous flat ridge I passed many clove plantations, frequently contiguous to one another. The soil on the ridges was a grey to black loam, but on the sides it was washed away as usual. I saw very few mangoes or coco-nuts about here.

The next considerable plantation I passed through (called "Kisiwani") might be described as very clean, but with soil washed away along the ridges, and needing drainage badly. The clove trees were all mature (the planting distance being 25½ by 25½ feet), and as usual shaded the ground. They were very regular and showed no vacancies, nor were coco-nut trees growing among them.

An open space contained a slave village and drying-ground,

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with some small clumps of pineapples. In every clove shamba that I had passed, trees were being cut down to admit more light and air, in some cases one tree, in others two or three together, and in very thickly-shaded places, whole rows had been cut down. In marked contrast to what I had seen in Zanzibar, slave huts appeared very scarce and far between in the Pemba plantations. In this northern part of the island I found myself in a regular clove plantation, extending on every side and as a rule very clean and regular; as on all the larger shambas, vacancies were very carefully supplied. I also saw a fairly large clearing of young cloves, the trees being 4 to 5 feet high, with cassava planted thickly amongst them. The surface soil on the sides of the ridges was everywhere washed away, and along this valley the very heavy wash had exposed the roots of the cassava and young clove trees. Drainage would of course obviate all this, but was practised nowhere. Except around Arab houses and slave huts, there were no plantations of coco-nut trees, though a solitary one might be seen here and there amongst the cloves.

After leaving the shamba succeeding Kisiwani, I passed into another called "Utani," a very weedy and neglected one, with many vacancies, high grass and bush, and much "ilook" grass growing. The trees were probably seventeen to twenty years old. Now and again I came upon curious basin-shaped low and abrupt valleys.

A distant ridge on the right was covered with a thick coco-nut grove, the first that I had seen for some time. On the left cloves continued, much neglected, with a great deal of "ilook" grass and bracken fern. I then emerged once more into uncultivated country, all bush, which was soon succeeded by a fertile area of luxuriant groves of coco-nut, cassava-fields, cloves and mangoes.

The next plantation was called "Kwale," and was the most northern one that I visited. It was a large shamba of fine old trees, regularly planted at a distance of 29 by 29 feet; the circumference of one tree at the base was 6 feet, and the average height was from 40 to 45 feet. The soil was very rich, dark grey, sandy loam.

This shamba was, on the whole, very clean. From here the

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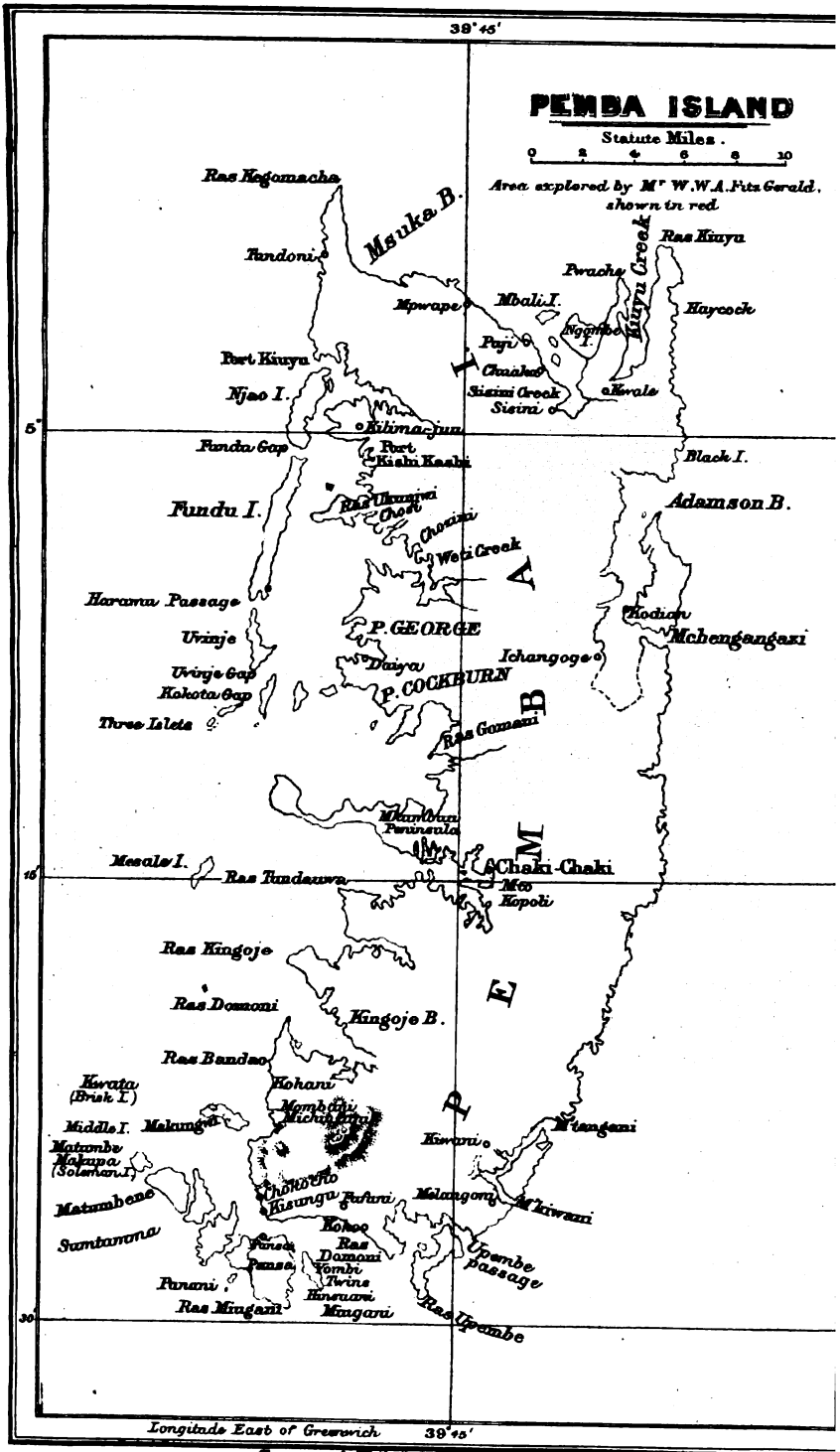


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path descended into a lovely valley, the sides of which were clothed with rich vegetation, and it possessed an abundant water supply from a small river, being another of these numerous valleys so well adapted for rice cultivation. Some fine mango trees were growing in it. A turn in the valley led into another one with a swampy river in the centre, where at last a little rice was growing.

A steep ascent finally brought me through scattered clove and mango trees to a sandy flat plain with a good deal of cassava, then into a fine, open, cultivated valley which belonged to Mohamed bin Jumah. Here I noticed the second cinnamon tree that I saw in Pemba, growing in front of some slave houses. It was 30 feet high, and its stem measured 3 feet 10 inches in circumference, the branches beginning 5 feet from the ground.

From here I returned to Weti, thus completing my inspection, and sailed next morning for Mombasa in the Sultan's steamer *Kilwa*, which had been sent for my use. The steward's brother had been cook to Bishop Hannington, and was murdered with his master near Uganda.

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# CHAPTER XI

## AGRICULTURE IN PEMBA ISLAND

Clove Cultivation in Pemba—Nutmegs—Copra Drying—Rich Soil of the Island—The Labour Question—Scarcity of Capital.

THE soil of Pemba so exactly meets the requirements of the clove tree—which is the principal product—that it may be useful to summarize the chief points connected with its cultivation, as at present carried on.

The trees on an average are planted 30 feet apart. They thrive best on flat land, with an upper layer of black to grey loam, and a subsoil of yellow clay. On nothing but clay they do not grow well, so that on the top and sides of ridges the ground is less suitable, owing to the wash so often referred to, no system of drainage being employed. The method of cultivation carried on here is the same as in Zanzibar, and the trees in special localities will begin to yield in the fourth or fifth year from planting; under ordinary conditions six years from planting. The cultivation of cloves was stated to be increasing every year; for instance, I noticed that there were many young plants on Chosini shamba, the owner of which proposed to extend it. On inquiring the reason of this extension of cultivation when they had not sufficient labour (*i.e.* slaves) to cultivate their old trees properly, the reply was that they hired labourers, procuring the services of the Wapembe,[1] or original inhabitants. These labourers were paid chiefly in kind, receiving in times of specially large crops, in the beginning of the season,

[1] Living on the eastern side of the island, and said to possess large numbers of cattle.



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one-half of what they gathered, and, later on, five pice for each *pishi* (about 6 lbs.). The average quantity gathered by a good picker would be twenty-five to twenty-six pishi, for which he would receive 125 pice, or nearly two rupees per diem. Six men are required to pick large trees, four on the ladder, and two underneath; and if the crop is a heavy one, a single large tree will afford them employment for a day. Small trees require four men, two above and two below. The gatherers each keep a separate basket, and in the evening measure out the clove-buds picked during the day. The buds have to be picked off the stalks, nothing being paid for these.

On an average each clove tree is picked three times in the season.

The hired labourer, for the same reason as in Zanzibar, is called in Swahili "kibarua." In short crop seasons the owner takes three-fourths, and the picker one-fourth only, of what the latter gathers in a day. All cloves are sun-dried, artificial drying being never practised. The larger shamba owners have a cleared space in front of their houses for drying cloves and copra.

I made special inquiries as to the reason of the difference in last season's yield between Weti and Chaki Chaki. The Arabs did not seem to be aware that there had been any diminution in the yield of Weti district, and, on being pressed, could give no other reason than "the will of God." Mohamed bin Jumah bin Said subsequently informed me that the deficiency of this season's crop at Weti was owing to the clove plantations being so overgrown with bush and grass that they had all to be cleared at once, and this took up so much of the available labour that there were too few hands left for the picking. This explanation—leaving out of account Mohamed's objection to hired labour already alluded to—would point to the conclusion that Chaki Chaki commanded a larger labour supply, and that in Weti district, the whole of the slaves having been put on to clean up the plantations, the owners were obliged to hire labourers for the picking, and to make up the deficiency in this way as far as they could. I carefully examined a sample of dried Pemba cloves, and

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found that they were undoubtedly smaller and blacker than the Zanzibar cloves, and the difference between them and the bright red heads of the Zanzibar product was very marked.

*Nutmegs.*—One afternoon, at Weti, my interpreter, Masud, brought me some dry, black nutmeg seeds which he had obtained from the shop of a Banian, who had informed him that nutmeg trees were growing in a shamba about two hours' distance off. He had also been told by a Zanzibari that nutmeg trees were growing in Zanzibar Island, in the Mwera valley, where I mentioned that a new bridge was being built. But although, when in Zanzibar, I repeatedly asked about such trees, the reply always was that they did not grow there. I saw none. Concerning the nutmegs in Pemba, I made several inquiries afterwards, and found the people quite ignorant on the subject, until I learned from Mohamed bin Jumah that he knew where some trees were growing, and he promised to show me the spot. I found the tree, a solitary one! on the plantation of Mohamed's brother, Said bin Hamisi bin Said, at the place called "Kidunda Uchowi." Its circumference at the base was 5 feet, and at 6 feet from the ground 3 feet. The lowest branches were 4 feet from the ground. The diameter of the spread, from end to end of the branches, was from 25 to 30 feet, and the tree was about 40 feet high. It was growing among large clove trees, and much too heavily shaded by them; no grass or weeds grew below. The soil was a very rich, black, sandy loam.

*Copra.*—I paid particular attention to the manner of copra preparation in Pemba. With reference to the characteristic black colour of Pemba copra, the Liwali of Weti informed me that they did not get enough sun for sun-drying, and the poor people, anxious to obtain an immediate sale of their copra, dried it by fire-heat, thus imparting the colour to it. They were quite aware that it brought them a smaller price in consequence, but in this way they could dispose of their nuts more quickly. The larger shamba owners have a cleared space in front of their houses for drying both the coco-nuts and the cloves. The Liwali also informed me that the coco-nut trees at Chaki Chaki were much finer than those at Weti,

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where, it was stated, there was a smaller rain-fall than at the former place.

As to the methods of drying copra—in the dry season it is put out in the sun in the ordinary way, and, treated thus, it takes seven days' hot sun to thoroughly dry it. In wet weather artificial drying is resorted to. The process is carried out on raised platforms, 4 to 4½ feet high, on which crossed sticks are placed close together. On these the coco-nuts, split into halves, are put, face downwards, and then covered with banana leaves to keep off the rain (which was pouring the day I inspected the operation). Underneath, the fire is made of the dry coco-nut shells; these give out a dense smoke which blackens the nuts. Two days' continuous drying is considered sufficient to thoroughly dry the nut, and the kernel or copra is then extracted from the shell and is ready for export. The dry shell is easily split with a knife, and is used for future burning. In view of the poor price these blackened nuts obtain, it seemed to me that it would be worth the while of some enterprising individual or firm—and much to the advantage of the people—to start an agency at Weti, and buy up the whole of the nuts of Pemba Island, shipping them to one of the drier mainland ports, where they could be broken and sun-dried.

An observer, glancing at the numerous clove plantations and coco-nut trees seen from the sea, is apt to believe the island to be much more extensively cultivated than it really is; but, in the interior, much land appears to be either altogether uncultivated or gone to waste. The island possesses many rich, low valleys, nearly all well irrigated, and eminently adapted for rice cultivation, the soil being chiefly a rich black loam. In fact it is everywhere very rich, except in occasional places where the sandstone substratum crops up near the surface; and the very large number of mango, jack, silk-cotton, and other native fruit trees could easily be utilized for the cultivation of both the vanilla and the pepper vine.

Cultivation in Pemba has long been so entirely dependent on slave labour, that any change in the status of the slave population must necessarily revolutionize the industrial conditions of the island. As in Zanzibar, the plantation owners



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of Pemba have for years felt severely the effects of the preventive measures directed against the importation of slaves, and, in order to obtain some limited supplies, every artifice has had to be practised to elude the vigilance of the authorities and of the cruisers. The price of slaves accordingly has run very high. As I have mentioned, I came over from Zanzibar in the Sultan's steamer *Kilwa*, and my interpreter Masud afterwards told me that slaves had been brought over on that trip.[1] Of course, the thing is done by stratagem, the women being dressed in bright cloths by the Arabs, and passed off as their concubines. The fare from Zanzibar was only three rupees. I was told that in Pemba slaves sold at as high as 100 dollars each, whilst in Zanzibar the price varied from 40 to 50 dollars. In Pemba, concubines sold for as much as 200 dollars, the price in special cases even reaching 1000 and 1200 dollars. I was further informed by Masud that the slaves were sometimes smuggled over from the German mainland in canoes, covered over with grass, on which fish were laid. The traffic was so profitable that one successful trip compensated for many failures, each slave yielding a profit of 50 dollars and more, if sold in Pemba. It was, I believe, the custom of our sailors in the old days, on boarding a suspicious boat, to scatter cayenne pepper or snuff through the nicks of the deck; the slaves, if any were on board, revealed their presence by vigorous sneezing, whereupon the dhow would be seized and the slaves at once set free.

Mohamed bin Jumah, with whom I often conversed, expressed a good deal of scepticism with respect to what I told him as to our proposed attempts at cultivation on the mainland. To the Arab, even in the case of so intelligent and advanced a man as Mohamed, no cultivation is possible in Africa except by slaves: these are simply indispensable. This is the inevitable result of ignorance. Surely, one would think, that even to the Arab mind the conviction must slowly come, that the exorbitant prices they have had to give for the few imported slaves would pay for a larger labour supply of a better and more profitable description! The march of civiliz-

[1] Soon afterwards one of these steamers was seized by H.M.S. *Blanche* for this very reason.

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ation has swept away once for all this cruel and ancient system, and it cannot be very long before English enterprise develops the resources of this lovely and fertile tropical island.

Another question of great importance connected with the future agricultural prospects of Pemba is that of the solvency of the shamba owners. Capital is essential to any degree of prosperity, and it is very possible that the present race of owners, owing to their financial situation, are not to be regarded (excepting, of course, such wealthy men as Mohamed bin Jumah) as likely factors in the future development of the island. Most of the land is mortgaged to Indian traders, who could foreclose at any time, if they saw it was to their interest to do so. By the present system of advances the shamba owner is compelled to sell his crop at low rates to the Banian who lends him the money, the lowest rate of interest charged being 20 per cent.—that is, twelve dollars for every ten dollars advanced. Very often the Arab owner is unable to repay his advances at the end of the year owing to short crops, and then the money that has to be again borrowed is added to the former debt and interest, and thus the shamba owner gradually becomes hopelessly involved and quite in the hands of the Banian. If the latter forecloses, as he cannot, being a British subject, hold slaves, and more especially as cultivating the land is not his profession, he sells the estate again—on advantageous terms if there are many slaves—and the new owner probably starts with a debt on his property, not being able to pay the whole purchase money at once. It is obvious that there can be no agricultural development and prosperity in Pemba while such a system as this prevails.

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# APPENDICES

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# APPENDIX A

## FURTHER INFORMATION RESPECTING THE WA-GIRYAMA[1]

THE Wa-Giryama recognize the following subdivisions of the *Nyika* tribes (*see* p. 103), of which for simplicity I only give the Swahili names—

| | | | | |
|---|---|---|---|---|
| *Wa-Duruma* | inhabiting | the | Duruma | country, |
| *Wa-Rabai* | „ | „ | Rabai | „ |
| *Wa-Ribe* | „ | „ | Ribe | „ |
| *Wa-Kamba* | „ | „ | Sabaki | „ |

and the *Wa-Yibana*, *Wa-Chongi*, and *Wa-Kauma;* the last being the colony from among the Wa-Ribe settled in the district of M'Kauma-Kendzi, in Northern Giryama.

On the northern limit (beyond the Kaumas) there are the *Wa-Sanye*, the tribe reduced to servitude by the Gallas, and now only speaking Galla, and on the southern side (beyond Duruma), the *Wa-Digo* inhabiting the Digo country.

The following are the tribes best known to the Giryamas. It is an interesting fact that the Dwarf dwellers of the interior, discovered by Mr. Stanley and other travellers, appear to have been already known to them.

1. *Dwarfs of the Interior*, called in Giryama Abirikimo. (Derivation, probably from the root *wiri* = little—*int'umbiri*, monkey = mt'u mdogo, little man—and *kimo*, stature.)

2. *Gallas.* Agala, of Ugalani. With these are reckoned, Alangula or Asanye; Usagidzuni (Sw. Usegegu).

3. *Masai.* Akwavi, also Wakwavi, of Masaini, poetically "Kwenyi fumo la Kungara," the land of the shining spear. Both the warlike Masai proper and the agricultural Wakwavi are included in the Giryama term.

[1] Taken, by kind permission, from the Rev. W. E. Taylor's *Vocabulary of the Giryama Language.*



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Aarusa (Sw. Waarusha). Tribes of Masai origin now settled in a semi-agricultural life to the south-west of Kilimanjaro.

Asugula. These are said to have their habitat near the Masai, or among them.

4. *Nyamuezi, people of.* Anyamwizi, of Nyamwizi (Sw. Wanyamwizi, of Nyamuezi, miscalled Unyamwezi).

5. *Nyasa tribes.* Anyasa, of Nyasa (Sw. Wanyasa). Properly the Nyangas of Lake Nyasa.

6. *Nyika* tribes (Sw. Wanyika, of Nyika), already referred to.

7. *P'are, people of.* Ap'are.

8. *Swahili.* Adzomba, of Udzomba. Waswahili, divided into—Wagunya, Ar. Bajuni; Wasawahili (people of Patta, Manda, Lamu, etc.); Waswahili, or -suahili, as far as Vanga; Wam'rima, of the Mrima (Ar. Meram), from P'angani southwards; Waunguja, inhabitants of Zanzibar (the Wapemba take their origin from Mombasa, etc.). Among people of Swahili stock appear to be—

Ajidu (Wakatwa).

Ambokomo, of Mbokomo (Wapokomo, of Pokomo).

9. *Taita, people of.* Ataita (Wa-taita). Near or among these are said to be the

Angambwa.

10. *Taveta, people of.* Ataveta (Wa-).

11. *Ukambani, people of.*

Akamba (Wa-).

Akikuyu, of Kikuyu (Wa-).

Anoka, a tribe said to be exceedingly clever at shooting. It is said that among these a young man, having chosen his sweetheart, can only claim her as his bride when he has sent an arrow through the lobe-hole in her ear at a certain distance. On the day of the betrothal he has to show that he is able to hit a strung bow-string with unerring accuracy.

12. *Usambara, people of.*

Asambala, of Usambala (Wasambaa, of Usambaa).

Abondeni, of Bondeni (Wabonde or Wabondei).

13. *The European nations* (Azungu, sing. Muzungu, of Uzunguni) whose names as known in Giryama are—

Angereza, of Ungereza, English.

Adachi, of Udachi, Germans.

Afarasa, of Farasa, French.

Arenu, of Renu, Portuguese.

14. *Asiatics.*

Ahindi, of Hindi (Wa-), Mohamedans from Hindostan.

Alabu (Sw. Mwalabu or Mulabu), of Manga; also Walabu, Ulabu; Arabs.

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Mabaniyani (Sw. Mwalabu or Mulabu); Pagans from Hindostan.

Mabulushi (Sw. Mwalabu or Mulabu); the Beluchi soldiers at the coast.

The following include some of the best-known *Trees* and *Plants* amongst the Wa-Giryama—

Andari, an enormous bulb, from 2 to 4 feet or more in diameter, forming the centre of a thick bush of green thorns, and itself covered with green knobs. Used, when hollowed out, as a tank for storing water; its flesh, as food for cattle; its infusion, as medicine for coughs.

Budzi, a herb; used as kitchen stuff (mboga) with the main article of food.

Chaa, a Euphorbia.

Choga, fungus; used for food.

Chongwa, medicine for debility of infants.

Huyi (usually in plural, ma-), a lichen, the "orchella weed" of commerce; the powder is applied as a medicine to sores.

Jungu-moto ("hot-pot"); a draught is made for facilitating child-birth.

Kalumwa, the "calumba" of commerce; a bitter stomachic and febrifuge.

Kidunga-dunga; the fruits cling to the cloths; used as kitchen stuff, for food; and, medicinally, for head disorders.

Kikwata, a thorny tree; its leaves are used as poison for rats.

Kilunga-kuku ("chicken-dressing"), the "turmeric" of commerce; used in preparing savoury messes, and in medicine.

Kimbiri; the roots are used as an antidote to the emetic "mukazi" (see below), also as medicine for abdominal dropsy.

Kinuka-muhondo; the fruit is eaten in debility.

Kirazi, the sweet potato.

Kiswenya, a herb; kitchen stuff; also, medicinally, for feverishness.

Kitozi, for making (wicker-work?) doors; also, medicinally for diphtheria.

Kitsambare, herb used as kitchen stuff; said to be very strengthening.

Kitsapu, a "Cycad." The heart of this palm-like tree is cut into dice and subjected to soaking and drying for three days, after which it may be pounded or ground and cooked or baked. Both this and the fruit are resorted to in times of famine. Unless carefully prepared it may cause fatal diarrhœa and vomiting.

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Kivuma-nyachi ("bee-hummer"); herb used as kitchen stuff.

Komba, a herb; the leaves resorted to in famine.

Konje-mala (plur. makonje-mala); furnishes the fibre on which necklaces are strung.

Koo; produces a perfume used as a cosmetic; it is said to strengthen the body.

Kunde, small reddish beans.

Kunji, the wild turmeric; the root is eaten in famine.

Loga-tsi, a herb used as kitchen stuff, for food.

Lurago, used as a flavour for food; and said to be very strengthening.

Luvumbane, leaves used for ear-ache.

Lwavi, a creeping plant with hairy leaves that sting like a nettle.

Mw-alaga-pala ("gazelle-slayer"), medicine for dropsy of young children.

Mw-angane, a herb; used as kitchen stuff, and considered very nutritious.

Mw-are, used for making red dye.

Mw-atsa, a Euphorbia with large permanent leaves; planted round houses, etc., as a defence against the white ants; the wood is used for making spoons and pot-stirrers.

M'bagahulo, a tough wood.

M'balazi, a shrub producing the beans called "mbalazi"; Sw. mbaazi.

M'balazi wa tsaka-ni, forest plant resembling the preceding.

M'bamba-kofi, a tree; produces large pods containing pretty black and red seeds, used for ornaments; the wood is good for building purposes.

M'bate, for building.

M'belenga; the infusion is used in diarrhœa.

M'bono, castor-oil plant or "palm-crist"; the seeds, called "mbono" (za), are boiled to extract the oil. The latter is used as a cosmetic, and occasionally in cooking and medicine.

M'bono-koma, "castor-oil plant of the Shades," of which the fruit produces an acrid oil, useful, externally, in fevers, as also the infusion (of the fruit or leaves?).

M'bule-bule-mundu ("in vain the hatchet"?), a tall tree with white wood; the infusion is used for hæmaturia, or "blood in the urine."

Mu-chera-ngombe; an infusion of the fruit is used as a medicine in bronchitis.

Mu-chetwa-alongo; the leaves are believed to act as a restorative when rubbed over the body.

Mu-dhandze; roots used medicinally for pains in the head.

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Mu-dimu, lime tree; the fruit is used as a zest, and in preparing pickles, and in medicine.

Mu-dimu-tsaka ("wild lime"), its fruit medicinal in diarrhœa.

Mw-embe, the mango; the fruit is used as kitchen stuff, and preserved as chips dried in the sun.

Mw-engere, a herb, of which the leaves are used as kitchen stuff, and in medicine as a hot compress in inflammations (abscesses, etc.).

Mw-erekera, used as a "medicine" (charm) for ensuring safety, etc. on a long journey.

Mu-fodzohi, a tree, used for making pot-stirrers and in building, etc.

Mu-fudu-madzi, tree; the light-coloured plum-like fruits are very pleasant *when ripe*.

Mu-fudu-unga, considered to be a variety of the preceding; it has dark, damson-like, somewhat insipid fruit.

Mu-funda, used for building purposes.

Mu-fune (Sterculia); when conveniently situated are felled for bridges.

Mu-funga-tsandzu ("bough-binder"), used in constructing stockades; fruit edible.

Mu-furanje ("yaws tree"), medicinal for "furanje" (*i.e.* "Frank disease," Sw. "buba"), prob. frambœsia; hence its name.

Mu-fwa, fruits are used as kitchen stuff.

Mu-gandamwa, fruit eaten; an infusion is made from this tree and used as a lotion in fevers with debility.

Mu-ganga-lungo m'bomu, a vine with uneatable grapes (ganga-lungo-ze).

Mu-godoma; its wood is used for making hoe-handles.

Mu-golokolo, a creeper bearing disproportionately large pods (3 feet long), called "ngolokolo"; the latter are used as rattles in dances (hence the name), and the seeds are resorted to in famine.

Mu-gomba, banana and plantain trees.

M'guji; the bark is used as a febrifuge.

M'gumo, the "borassus" palm; the leaves are trimmed and used as umbrellas, and the tree is sometimes tapped for its toddy, and in famine-time is often cut down for the sake of the heart of the green part.

M'gwale, wood used for making bows.

Mu-halanda, wood excellent for bedstead frames and joinery.

Mu-hama, millet, or "Caffre" or "Turkish" corn.

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Mu-hega-kululu, thorny acacia; its thorns swell into nodules at the base; the latter become hollow and perforated, and whistle in the wind; hence its name, "Cry-trapper."

Mu-hingo, ebony; used for making clubs, etc.

Mu-hiri-hiri, tree; its red bark, pungent to the taste, useful for its sustaining properties, for which the Masai carry it on their raiding expeditions—a little piece or two in the water-gourd. The infusion is a medicine for influenza.

Mu-howe, fruits are used internally as a medicine in dropsy.

Mw-ifwa.

Mu-kambi, furnishes a nutritious kitchen stuff.

Mu-kami, good for its shade.

Mu-kanju, "cashew"; the apples may be eaten with salt water, and the nuts roasted and peeled for eating.

Mu-kapo, lemon; its fruits (ma-ka-po) are but poor in Giryama.

Mu-kayu-kayu, for making doors.

Mu-kazi, furnishes a strong emetic.

Mu-kidigo, medicine for croup in infants.

Mu-kijego, Mu-kula-usiku, other names for preceding.

Mu-kindwi, wild date; the dried fronds furnish fibre for mats.

Mukingiri; the roots are used medicinally for young children with fever.

Mu-kipo; the fruit is eaten.

Mu-kirindi, possesses a fine long grain, and is used for knife-handles, etc.

Mu-kironda ("sore tree"); if the leaves are used fresh as an application to a sore, they are said sometimes to heal it within a couple of days.

M'kitsere.

M'kodongo; the chips are said to poison fowls.

Mu-koko, mangrove; makes good fuel.

Mu-koma, the *Hyphæne thebaica*. The fruits, which are thought to resemble gingerbread in taste, may be gnawed for food, and the shell within is carved to make snuff-boxes, ferrules of hatchets, etc. The kernel inside all is powdered for food in famines.

Mu-koma-manga (Arabian m'koma palm), pomegranate; the infusion is used as a lotion or bath in "baridi," or chill.

Mu-kone; the fruit is edible.

Mu-kongoza, wild vine with edible fruit; roots used as medicine for anæmia and jaundice ("safura").

Mu-kuha, the fruit used in famine.

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Mu-kula-usiku ("every evening"), a name for the "m'kijego," *q. v.*

Mu-kulu, fruit edible.

Mu-kumbaku, tobacco; for snuff, chewing, and, more rarely, smoking.

Mu-kuna-mbawa, a jungle tree; its white wood is useful.

Mu-kuwa, for making brooms.

M'kwaju, tamarind: used as zest for food and to make pickles, also for cooling drinks.

M'kwakwa, bael? The makwakwa are eaten.

Mu-kwala-fisi, a jocular name for any tree with awkward roots; "hyena-tripper"; *à fortiori*, a "man-tripper."

Mu-kwala-paka, "cat-tripper"; cf. preceding.

Mu-kwamba; this tree furnishes a charm for journeys.

Mu-kwembe, edible fruit; wood furnishes knife-handles.

M'lala, the dwarf-palm; the leaves, when split, are used for making cord, mats, frails, and native needles.

M'lala-piri; the leaves are ground up and used as an application to sores.

Mu-lungu, for making doors.

Mu-mahi, the sticks used for building purposes.

Mu-mangira, fruit edible.

M'-nago, fruit edible.

M'-navu, leaves boiled for kitchen stuff.

M'nazi, coco-nut palm; comparatively scarce in Giryama proper. The unripe nut is brought from long distances in times of drought for the sake of its "milk." The ripe nut furnishes a cream used in cooking, and the shells are made into ladles for water, etc. The plaited leaves form "mkandza," used for roofing, party walls, etc.

M'ngambo; the fruit is resorted to in famine.

M'ngambo-kapehe, variety of preceding.

M'ngazija, *Manihot utilissima*, cassava, Sw. m'hogo.

M'nya-dzua, fruit edible.

M'nyumbu, bark used like that of the Mu-hiri-hiri, *q. v.*

M'mongolo (or m'ongolo?), the copal tree; the semi-fossil gum (m'ongolo) is dug up and sold to the Hindi merchants.

M'orya, gutta-percha or indiarubber? the fruit is edible.

Mu-papayu, the papaw; fruit very plentiful in the season.

Mu-papayu-mulume, the male papaw; an infusion of the rootlets is used for blood in the urine, etc.

Mu-pawa, a bean; the large seeds (mapawa) are in esteem as kitchen stuff.

Mu-pera, the guava; scarce in Giryama proper.

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M'pigizo; the steam of a hot infusion of the leaves is said to be good in painful ophthalmia.

M'pili-pili, red pepper; pounded with salt, is used as a condiment; also an ingredient in pickles and various medicines.

M'porojo; the wood of this tree is used for making the sheaths of swords, etc.

Mu-pupu, produces a smaller bean than the mupawa, *q. v.*

M'rabu, the pumpkin plant; the fruits are much esteemed as kitchen stuff.

M'rihi, tall handsome tree with small leaves; it furnishes a medicine for hemicrania.

Mu-rimbo, yields bird-lime.

M'sasa; the leaves of this large shrub serve all the purposes of sand-paper; the wood, when merely licked, is said to be medicinal for fever.

Mu-sasakwa; the leaves are said to be good for headache.

Mu-sendze; the sweet wood is prepared as a food in famine.

M'shinda-alume, shrub; very tough and supple.

M'shondohera-nguluwe; the greenish-drab flowers fill the surrounding air with stench (hence the name).

M'siswi, a thorny jungle tree.

Mu-tulama-kwalala; the heavy wood is used for making the "kipungu," a sort of defensive weapon for parrying sword-cuts, shaped like the head of a pick-axe.

M'tanda-mboo; medicinal for discharges from the urinary organs.

M'tanga, the "incense tree," producing gum used for fumigation by the Giryamas.

Mu-tola-mandzi (?). See Mu-tulama-andzi-e.

Mu-tsami ("sweet-tasted"); fruit edible.

Mu-tsedzi; the fruits are eaten in famine.

Mu-tsengezi; the fruit is said to be much liked by goats.

Mu-tserere; fruit edible; and the root is carried as "medicine" on a journey.

M'-tsoma-pengo, fleshy-leaved ivy-like creeper; is applied to the teeth to stop bleeding after the operation of chipping, hence its name, "stick-in-the-notch-tree."

M'tsodza-gunga (lit. "ornamental-skin-scar," or tattoo tree); used medicinally, the pith for bronchitis, the roots for sores.

Mu'tsunga, a sort of bitter spinach; one of the most common "mboga," kitchen stuffs, for the wari or porridge.

Mu-tsungula; the fruits are edible.

Mu-tulama-andzi-e, a parasitic plant with red flower, hence its name (which may be applied to any parasite).

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Mu-tunguru ; resorted to in famines.

Mu-ungo, the *Landolphia*, indiarubber vine ; the juice is collected and sold.

Mu-vundza-kondo (" battle-breaker "), a spell for ensuring a good journey ; the roots are powdered and sprinkled on the ground before starting.

Mu-vundza-rere, ropy creepy with soft green stem and minute leaves (where any), with large rose-and-white waxy scented flowers ; the stem resembles the " vundza-rere " snake —hence probably its name.

Mu-wuu ; the leaves are medicinal for stomach complaints.

Mu-zahe ; furnishes bark-bonds.

Mu-zhongwa.

Mu-zimiri ; roots used for influenza and catarrhs.

Ndago (perhaps plur. of lurago ?), " *Cyperi* " or sedges ; the scented roots of one variety are given for pains in the stomach.

Ndiko, ground-orchids ; a variety produces a fine varnish used for the barb-ends of arrow-shafts.

Ndogo, underground nuts (?), used in famines.

Ngulumbo, a grain or fruit used in famines.

Nyasi (plur.) grass.

Ria (plur. ma-), enormous block-like bulbous plants, somewhat resembling the andari, but less symmetrical, and devoid of the bush-like growth and thorns of that plant. An infusion of the bulb is given for diarrhœa.

Talakosha ; kitchen stuff, said to be strengthening.

Totola ; an infusion of the leaves is given in neuralgic (?) diseases.

Utsungu (muhi wa), the tree from which the Wa-Kamba prepare their arrow-poison (utsungu).

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# APPENDIX B

## REPORTS AND VALUATIONS ON EAST AFRICAN PRODUCTS.


| | | | |
|---|---|---|---|
| *Aloes* ... ... ... | ... *p.* 624 | *Jute* ... ... | ... *p.* 648 |
| *Beeswax* ... ... | ... 626 | *Kapok (tree cotton)* | ... 648 |
| *Castor-oil seed* ... | ... 626 | *Maize* ... ... | ... 648 |
| *Coffee* ... ... | ... 627 | *Orchella weed* ... | ... 649 |
| *Coir (coco-nut fibre)* | ... 629 | *Olive cultivation* ... | ... 649 |
| *Copra* ... ... | ... 632 | *Ostrich feathers* ... | ... 650 |
| *Cotton* ... ... | ... 634 | *Rice* ... ... | ... 650 |
| *Cotton-seed* ... ... | ... 640 | *Simsim or sesame* | ... 651 |
| *Dari (metamah or millet)* | ... 641 | *Skins* ... ... | ... 651 |
| *Ebony* ... ... | ... 641 | *Tobacco* ... ... | ... 651 |
| *Gum Arabic* ... | ... 641 | *Wheat and barley* | ... 653 |
| *Ground-nuts* ... | ... 642 | *Various samples brought home by the Mombasa-Uganda Railway Survey* | 653 |
| *Gum-copal* ... ... | ... 642 | | |
| *Indiarubber* ... | ... 642 | | |


### ALOE AND OTHER FIBRES.

*Valuation.* "*London, July* 1890.

"*Aloe fibre.—A.* Rather short, but strong; we think might be used for titon Manilla hemp purposes; if so about £24 to £25 per ton.

"*B.* Brown, but strong, and longer—£22 to £23; but for other purposes perhaps £15 to £20.

"*C.* More like usual aloe fibre, but short; market for aloe fibre very dull—£16 to £20."

### *Sansevieria Guineensis.*

*Report.* "*October* 1890.

"256 lbs. in 7 bales, but little cleaned; mixed, coloured; should be white; badly packed, being in coils. Value, about £12 15*s.* 0*d.* per ton. This fibre is quite a novelty, and if properly done, it might fetch £25 per ton."

The seven bales were sold the following month, realizing £17 per ton.



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### *Mr. Christie on East African Fibres.*

"IDE AND CHRISTIE,
"*Fibre, Esparto, and General Produce Brokers.*
"*72 Mark Lane, London, E.C.*
"*May* 25, 1897.

"DEAR MR. FITZGERALD,

"With regard to Fibres I have read your remarks with interest. It is somewhat unfortunate that the market values of what are technically called 'white hemps' (Manilla, Sisal, Mauritius, and New Zealand) have gone steadily and persistently downward during the last three years, and now stand at a very low level. The prices to-day offer no encouragement to new enterprise, and perhaps in your reference to the values we placed on *Sansevieria* ten years ago this fact may be lost sight of, and some misconception arise.

"The following will show the depreciation that has gone on since 1887—

| | May 1887. | May 1892. | May 1897. | |
|---|---|---|---|---|
| Manilla hemp ... ... | £31 10*s.* | £28 | £15 15*s.* | per ton. |
| Sisal hemp ... ... | £32 | £23 | £15 | „ „ |
| Mauritius hemp ... | £29 | £21 | £21 | „ „ |
| New Zealand hemp | £29 | £19 | £14 | „ „ |

"As the market value of *Sansevieria* fibre would be entirely governed by the prices ruling for the recognized hemps above-mentioned, I would suggest that you should make your readers fully aware of what these values are at the present time. Moreover, it would be hazardous to predict any return to the market values of the past. The development of new countries, improved methods of treatment and facilities are all tending to cheapen commodities; and with regard to fibres, the introduction and establishment in market estimates of anything new is rendered increasingly difficult by the cheapness of those already known and in long industrial use.

"Although *Sansevieria* has been known to us for many years, yet, with the exception of small parcels from India and Ceylon, sold under the name of 'Moorva' fibre, no trade has ever been done in it of late years; even these small consignments have ceased. The suggestion I made to you last week, that the most effective way of determining its value is to send five tons home for sale, is, I think, by far the best. Native labour and methods may well be employed, and the aim should be to produce a fibre of good length, and as *white* as



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possible. While small samples are good enough to enable an opinion to be formed of the merits of *Sansevieria*, it is absolutely necessary that a merchantable quantity be put on the market before its real place and class amongst fibres can be ascertained. But the English grower must recognize that values are very low, and that at first *Sansevieria* may probably not attain its full price, because as a commercial article it is practically unknown meantime.

"*Ramie.*—I am afraid that for some time at least this need not be more than mentioned. Many processes have been started, and one or two of them give promise of cheapening the production; but the schemes are too tentative for any accurate judgment to be given on their merits.

"*Pineapple fibre.*—The extraction of the fibre from the leaves is a slow and difficult one, and the yield is very small. I doubt if this would be worth attention. . . .

"Believe me,

"Yours very faithfully,

"(*Signed*) JOHN CHRISTIE."

## BEESWAX.

*Broker's Report.* "*October* 1890.

"The sample appears good, and if equal to sample would at present bring about £5 per cwt., but it must be run into blocks and kept as clean as present sample; the blocks might weigh 10, 12, or 15 lbs. . . . We advise your getting some sent over in nice square blocks or saucer-shape, and send at first a few cwts. on trial."

## CASTOR-OIL SEED.

*Valuations.* "*London, January* 1891.

No. 1. "Castor-oil Seed.—This is reported as of good quality, and on the spot here would sell at about £10 per ton."

"*Glasgow, August* 1891.

No. 2. "*No.* 1.—Dark seed, medium size, not desirable seed. The amount of oil to be got out of it must be very small, and we could not put a value on it. Probably none of our crushers would buy it.

"*No.* 2.—White seed, large size, fair quality; value to-day £9 5*s.*, if sound, delivered Glasgow.

"*No.* 3.—Dark seed, small size. Fair quality so far as can be judged from so small a sample; value about £9 per ton."

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## COFFEE.[1]

*Reports.* "*November* 1891.

No. 1. "1 bag African coffee, looks like Cassenga of extra good quality, but mixed with a few blacks; value in bulk about 70*s.* per cwt. We think the coffee would find a ready sale."

"We are now pleased to advise your sample bag of coffee was sold yesterday at 62*s.* per cwt."

"*September* 1892.

No. 2. "We have examined the sample of African coffee in the cherry, and find it is African Cassenga. It appears to be of very good quality, but it is rather difficult to judge from this sample, as we think it has suffered through not having been properly dried and prepared. The spot value properly husked and picked is to-day 60*s.* per cwt., but in the cherry it has little or no value in the market."

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I reproduce here, by kind permission of *The Times*, a very important as well as interesting letter from Mr. J. Ferguson, of the *Ceylon Observer* and *Tropical Agriculturist*, on "The Production of Coffee and Tea in British Dependencies," published in *The Times* of June 1, 1896.

### *The Production of Coffee and Tea in British Dependencies.*

TO THE EDITOR OF *The Times.*

"SIR,—There is a great deal of misapprehension current in reference to our old Ceylon staple, coffee, its production and price, which, with your permission, I should like to correct. The other day, Lord Stanley of Alderley, addressing the House of Lords, included 'coffee' in his list of products suffering from depreciation of price, although, for the past eight years at least, coffee has been pre-eminently the tropical product which, contrary to the theory of bimetallists, has not only maintained but increased its gold value in the markets of the world. Thus, in 1889, the lowest and highest quotations for middling plantation coffee in London were 91*s.* and 102*s.*, and they have not since fallen below that figure, while for 1895 the range was 100*s.* to 107*s.*, and there is little difference this year. This is due to the fact that production

[1] For Report on Uganda Coffee, see below, p. 654.

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has not kept pace with the demand for the continent of Europe and North America; and yet here, again, a curious misapprehension prevails as to there being an intimate risk of the over-production of coffee, as of tea. Thus, at the recent reading of a paper before the Royal Colonial Institute, on 'The Development of Tropical Africa,' by Sir George Baden-Powell, in the discussion that followed, Dr. Morris of Kew stated that 'in the regular cultivation of coffee, cacao, cotton, kola, and fruit, West Africa has a great future before it.' And in describing the coffee industry in the Nyasa Hill district (British Central Africa), I made the remark—'The chief staple, coffee, is one of which there is no fear of over-production at present.' Nevertheless, the chairman (Sir R. W. Herbert), in summing up and referring to tropical products, said—'It is desirable as far as possible to seek for new staples, rather than to crowd the markets with ordinary produce, like tea and coffee, which seem in danger of being over-produced.'

"Sir Robert Herbert is correct as regards tea, but he has overlooked the great falling-off in the production of coffee within the British dependencies during the past sixteen years. This has been mainly due to the terrible effects of the fungus enemy on the coffee of Ceylon, a great part of Southern India (and even of Java). Without going into details, let me venture to give approximate and contrasting estimates of coffee exports from British dependencies.

| | Maximum annual export, 16 to 18 years ago. | Estimate for 1896. |
|---|---|---|
| | Cwt. | Cwt. |
| Ceylon ... ... ... ... ... | 1,100,000 | 50,000 |
| South India ... ... ... ... | 450,000 | 240,000 |
| West Indies ... ... ... ... | 150,000[1] | 80,000 |
| Straits and North Borneo ... ... | | 30,000 |
| Total ... | 1,700,000 | 400,000 |

"This indicates a woful deficiency, and I see no prospect of more than a very limited increase for many years in the above dependencies. I am free to confess that at the same time Brazil has maintained and even increased its large production

[1] "The West Indies attained their maximum early in this century, Dr. Morris telling me that Jamaica alone exported 260,000 cwt. of coffee in 1805, while other islands—Barbadoes, Antigua, Dominica, Montserrat, St. Kitts, and the Virgin Islands—made up as much more, or say from 500,000 cwt. to 600,000 cwt. as the maximum about 90 years ago."

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of coffee; but this has been counterbalanced by the notable falling-off in the crops of Java and Netherlands India generally; and were it not that American and European capitalists have been developing coffee plantations in Mexico and Central America (Guatemala, Costa Rica, etc.), the consuming markets would have been barely supplied. The continued high price has, indeed, encouraged Ceylon tea-planters to invest surplus capital in a new coffee district in East Java; while I am aware that city capitalists are looking to foreign states in South and Central America for coffee investments.

"Surely, then, experiments in coffee cultivation may well be encouraged in the British divisions of Africa (as well as in the Malayan Peninsula, North Borneo, etc.), and more especially in British Central Africa, under Sir Harry Johnston's enlightened administration. The first limited company for coffee cultivation in Nyasaland was formed a year ago in Ceylon by planters and merchants, whose manager, now hard at work opening up a plantation, gives an encouraging report of his prospects in labour supply, crop, etc.

"It will be a long time, however, before such enterprise or any other enterprise at present within British territory, can seriously affect the coffee market; and I see no early prospect, in any other quarter, of an over-production of coffee. The case is rather different with tea, in view of the large areas planted and still being opened in India and Ceylon. The export of tea from India has steadily risen, year by year —2,250,000 lbs. in 1861-62, until the estimate for 1896-97 is 144,000,000 lbs. In the case of Ceylon, we began with 23 lbs. export (twenty-three years ago) in 1873, and for 1896 the official estimate of total export is 102,000,000 lbs.

"I am, Sir, yours truly,
"J. FERGUSON."

*Royal Colonial Institute, Northumberland Avenue, London, W.C.*

## COIR (COCO-NUT FIBRE).

*Valuation on 5 pkgs. Coir Fibre.* "*April* 1891.

"Internally damp, partly cleaned, little husky, mixed colour. Value, £10 per ton. If properly cleaned and dried before shipment, would probably realize £15 per ton."

*Report on the Samples from Patta Island, brought home by Mr. FitzGerald.*

"*Coir Fibre*, poor, dirty, dull. Sound, value per ton, £4.

"*Coir Yarn*, poor, dark colour generally, fair make, but somewhat irregular. Sound, value per ton, £13 to £14."

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*Suggestions by an Expert written for the information of the I.B.E.A. Co.*

"It" (coir fibre) "is made in India and Ceylon during the spare time of the women and children of families of small cultivators, who exchange the produce for rice and other necessaries with the small shopkeeper. The value of the fibre varies according to colour and fineness—say from £9 to £18 in London.

"The process is this—The husks are taken off the mats, and steeped in ponds from two to four months to rot off the substance that binds the fibres together. When this stage is reached, the husks are beaten on a wooden block with a good-sized 'beetle.'

"This work is done beside water, so that the refuse can be washed off readily as the fibre yields to the beating. It is then dried (in the shade, if possible), and at once picked over to shake out the remainder of the refuse, which is like corky sawdust, and remove the discoloured fibre to bring the colour as near as possible to that of pale, clean straw. It should see as little of the light as possible, as exposure turns the colour a reddish-brown, and enormously depreciates its value. When picked clean and quite dry, it should be baled in a hydraulic press and shipped home. . . . If it should be decided to work the stuff—and perhaps make it into yarn and rope, which ought to be much needed in Africa—I'll be glad to get you an expert from India to teach the African all about this industry."

*The Coir Fibre Industry on the West Coast of Southern India.*

The following extract shows how a prosperous and extensive trade in the *Coir* Fibre industry has been built up in Southern India—

"Within the last twenty years a vast extension of the economic uses to which this valuable fibre is put has taken place. The term 'coir' usually applied to this material is the Anglicized form of the South Indian 'tayarn,' cord or twine, and not applied in India to the raw fibre, which is called in the Tamil language 'savuri.' The fibrous husk or rind of the coco-nut is easily stripped from the nut while yet green by striking it on the point of an iron spike, and is then steeped in salt or brackish water, where it lies for several months, until the softer portions of the husk rot away and the strong fibre alone remains. This is taken out, beaten

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with a stick to separate and clean the fibre, and hoisted with the required number of strands into rope, or woven into matting, while the stiffer fibres are made into brushes and other articles of domestic utility.

"The fibre is pressed for shipping into bales weighing 200 lbs. each. The attempt has been made to prepare the fibre from the dried husk in England, but without success.

"Much of the coir fibre used in England is brought from Ceylon; but a large and increasing quantity is now exported from Bombay and the Western Coast of India. The supply is not inexhaustible, but as prices rise cultivation is encouraged, and as the growth of the palm is along the sea-coast where other crops cannot be grown, the trade is a profitable one. Factories for the weaving of coir-matting have been opened up by English and American firms at Alleppy, Quilon, Colachel, Cochin, etc., and turn out a considerable quantity of goods. Spinning is not attempted here, being more cheaply done by hand at the places where the fibre is produced. Along the coasts of the backwaters and canals many people may now be seen busily engaged in scraping and cleaning the fibre and twisting it into yarn. In the factories the yarn is first sorted to its various shades and qualities. The warp is made by boys running backwards and forwards, then it is flattened and smoothed for weaving by being run through heavy rollers. The weaving is laborious work, performed by men, who earn two or three rupees a week at it. The web is again rolled to give it some finish, wound securely in a roll and marked. Large profits have been made in this manufacture in India. But it can now be carried on so much better in England, with the machinery and appliances available there, that large quantities of the yarn are exported.

"One firm in Lancashire have introduced steam-loom weaving of this material. The various shades of fibre—cream-coloured, reddish-brown, and blackish—which vary greatly according to care and skill in preparation, are first carefully separated, and coco-nut matting is now made of fine quality with pretty shades of colour, and in pleasing patterns, so as to be available for higher uses than the very coarse makes, and the material is most durable. The yarn is also plaited by machinery into cinnet or belting; labels made of coir bear exposure to salt water better than anything else, the tannin which it contains preventing the fibre from rotting; they are exceedingly light and buoyant as well as elastic. Even the refuse and broken coir can be turned to account for stuffing mattresses, and is used in horticulture, as no animal will touch it.

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"The exports from Travancore of this material form a large proportion of the trade of the district, and amounted in 1879-82 to nearly 150,000 cwt., valued at 13¾ lacs of rupees (say £130,290 sterling), and paying to the Government 68,000 rupees. Of the coco-nuts themselves, nearly 9,000,000, valued at nearly 260,900 rupees, were sent away. Other products of this palm exported, as oil and copra, or dried kernel, were valued, the former at 322,100 rupees, and the latter at no less than 26½ lacs of rupees, making a total value of the exports of products of the coco-nut palm from Travancore alone of 46¼ lacs of rupees (nearly half a million). Some thousands of tons are also exported from Cochin. That trade is certainly very profitable to India.—*India Mercury.*" [1]

## COPRA.

### *Broker's Report on Copra from Magarini Plantations.*

"*October* 1892.

"We are now able to report on the sample parcels of East African copra, ex *Malda*—Mombasa.

"235 bags.—Excepting Cochin, we have rarely seen finer copra. The nut is of great beauty and thickness and well-matured, and the quality is fine. It is also well sun-dried, and fairly clean and suitable in every way. Still there is a certain amount of 'weevly' dust in the cups, as per the small sample herewith (which please open carefully). Also here and there, there are a few pieces of dried and shrunken copra. After considerable trial of the market (first bids we got being only £13 5*s.*), we sold this parcel at £14 5*s.* per ton, London landed, terms as per contract No. 81. No doubt a higher price would have been got for a parcel of 200 to 300 tons, as these small lots never fetch the full value. This fine copra is used on the Continent, not for oil, but for the manufacture of margarine, and it goes to one of the best mills. It always remains to be seen how the percentage of oil or fat compares with Cochin, and this we shall let you know later on. Please note that this quality is suitable for the north of Europe only, being too good for the Marseilles soap-oil. We could readily get through 3000 to 4000 tons a year to London or Hamburg alone—in fact, there is no limit almost to the outlet." [2]

[1] Extract from Messrs. A. M. & J. Ferguson's *Coco-nut Cultivation.*

[2] "The crushing has resulted favourably, giving 64 per cent. of oil, and we are well satisfied with the quality."—*December* 30, 1892.

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*Quotations from Broker's Reports.*

"*September* 1893.

"We have sold your copra at £16 per ton."

"*January* 1895.

"150 Bags.—Fair merchantable, sun-dried, very broken, value, £13 per ton. The market at present is very flat."

*Mr. Weaver's remarks on Coco-nut Cultivation on the Magarini Plantations.*

"*Coco-nuts.*—For ploughing I purchased fourteen oxen. These I trained to the yoke, and very hard work I found it, for I was far from being an expert in such matters. I then taught 'Giryama,' a native, and also a couple of Soudanese to plough. I had much trouble with the men, but after some time we were able to plough about an acre of ground per day. When the oxen and men were trained, we ploughed up the land in between the rows of coco-nut trees, and at the same time planted ground-nuts in every other furrow; when these were well grown we ploughed them under for green manure. We got over a lot of ground in this way, when unfortunately the oxen died, and we were at a standstill again. We then purchased four camels, and found that these did very well. One camel was able to draw one of Ransome's ploughs, and we could turn over about one acre and a quarter a day, using two camels and two ploughs.

"At the commencement of 1895 we built a barbicue or drying-floor. This was 100 feet long and 35 feet wide, and was built of concrete, and plastered over with a mixture of lime (coral) and sugar prepared from the sap of the coco-nut tree. This floor was large enough to hold 6000 nuts, and it kept the kernels very clean.

"I employed natives to husk the nuts. There is a class of men who are very expert at this work. The rate of pay for husking was one rupee per thousand nuts husked. Many of the men were able to earn one rupee per day. Men who were not accustomed to the work would only husk from fifty to one hundred nuts per day, and would then be unable to work again for some days, owing to sore hands.

"When the nuts were husked they were broken into halves, and laid in the sun for the kernels to dry. After four days they would be sufficiently dry to allow the kernels to be separated from the shells. The kernels were then allowed

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to dry thoroughly for some six days, and were then cut into small pieces, and packed into bags and sent to the coast for shipment to England.

"The various owners of plantations in the neighbourhood watched my experiments with much interest, and I have every reason to believe that they were satisfied that I was amply repaid for the trouble and extra expense, and I noticed that many of them were paying more attention to their own trees."

## COTTON.

*Broker's Report.* "*London, October* 1892.

"*African Cotton.*—Good colour, rather leafy, some shell. The staple is rough, rather harsh and irregular, and has been cut in ginning, the sample showing a good deal of nepe. Value, about 3¾*d.* to 4*d.* per lb."

### *Extract from Administrator's Letter to the Directors I. B. E. A. Co.*

"*Mombasa, January* 1892.

"Mr. Rogers writes as follows, referring to a sample sent to Lamu for shipment to London—

> 'The crop has been a success, and I am endeavouring to persuade natives to cultivate the same, as the soil of Witu appears to be peculiarly adapted to the growth of this plant.'

"I am sending Mr. Rogers a supply of 'Sea Island' seed, which appears to do well here."

### *Cotton in Witu District.*

"*Chamber of Commerce,*
"*Manchester, June* 2, 1893.

"DEAR SIR,

"The small sample of cotton referred to in your letter of May 26 was submitted to the Chamber in February 1892, by a former Manchester merchant, Mr. Francis Amos, of Windermere, who received it from Bishop Tucker. It was examined by an expert.

"The cotton was grown at Witu, apparently from Egyptian seed, and was exceedingly fine, the staple being of fair length and strength. Prices were very low at that time, and it was valued at *7d.* per lb. It would rank here as 'Sea Island Substitute,' and would bring a relatively high price whenever 'Sea Island' might happen to be scarce. Recently I had an interview with a gentleman, Mr. R. J. D. Macallister, who I

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understand has been, or is, in the employ of your Company. He knew the plantation on which the sample forwarded by Bishop Tucker was grown. The particulars given to me by him as to the cost of producing cotton near Lamu, *not Witu*, are summarized in a paragraph of our *Monthly Record* (p. 125), of which I will send you to-morrow a copy. I shall be glad to answer any questions you may desire to ask, as far as I can.

"Faithfully yours,

"ELIJAH HELM,

*Secretary.*

"THE SECRETARY,

"*Imperial British East African Company,*

"*2, Pall Mall East, London, S.W.*"

*Extract from the Manchester Chamber of Commerce Monthly Record, May 31, 1893, on Cotton Growing in British East Africa.*

"Particulars were presented to the Board of the results of cotton-growing on a small plantation of 200 acres at Witu, in British East Africa. Samples of the cotton produced on this estate were submitted to the Chamber in February 1892, and it was found to be of a quality ranking as Sea Island substitute. The particulars which had been received showed that the yield was at the rate of 400 lbs. per acre. The plant is not killed during the winter, and produces abundantly for three years in succession. The climate during the growing and picking season is characterized by intervals of moderate rain-fall, and appears to be free from incidents injurious to the plant. Labour is cheap, abundant, and efficient, and it is stated that at the current rate of wages for field labourers, immigrants from India can be easily obtained. The figures presented indicate that cotton-growing in this part of British East Africa is very profitable."

*Broker's Report on Samples of Cotton brought home by Mr. FitzGerald.*

"TO THE SECRETARY,

"*Imperial British East African Co., Ltd.,*

"*London, S.W.*

"*November* 1893.

"SIR,

"Referring to our letter of the 4th inst., we beg to advise having carefully examined the samples which you have kindly sent us, and send herewith a formal valuation and report on same; same being, of course, rather guess-work, especially with reference to the unginned cotton, because

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cotton in the seed we are never called upon to handle here; generally speaking, it appears to us that the Sea Island cotton has been the most successful, and it would be interesting to know exactly as to whence the supply of seed for 4A and 4B was obtained, so as to judge whether the difference of quality is caused by the question of the seed, or by the land on which the two lots were grown. The Upland cottons appear to us to have been grown in too dry a situation, and they would probably be benefited by irrigation so as to produce a smoothness and oiliness of staple."

### *Valuation of Sundry Samples of Cotton.*

*Account of the Imperial British East Africa Company, Limited.*

| *Mark.* | *Description.* | *Price.* | *Classification, etc.* |
|---|---|---|---|
| No. 1. | From plantation near Mombasa. | 4¾*d.* | Bright, clean, and good staple, but irregular with peculiar elastic strength; too irregular in length to value satisfactorily; say average 4¾*d.* per lb. if classed out. |
| Nos. 2 and 5. | (2) Native short-stapled cotton, from Mattaroni Coast-land, north of Lamu.<br>(5) Ditto, cleaned by native ginning machine. | 3½*d.* | Very poor stuff, dull, rough, uneven, and native ginning bad, probably worth 3½*d.* per lb. |
| No. 3. | Very small sample of Uplands from Witu District. | | Quite unable to value, but appears like No. 2. |
| No. 4a. | Sea Island from Shaka, Witu District. | 12*d.* | A decided success; very fine staple, and good length and strength, but will require a special gin, and seed will have to be renewed from Carolinas very frequently to maintain strength and length; worth generally about 12*d.* per lb. |
| No. 4i. | Ditto. Ditto. | | Similar to last, but inferior in length, strength, and appearance. |

### *Report on Samples of Mattaroni Native-grown Cotton.*

"*November* 1893.

"We have to-day seen the chief shippers of cotton to Italy and the Continent generally, with regard to the suitability of

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lots Nos. 2 and 5 for that market, and find that it is the style they can use. However, the export from here has been exceedingly meagre of late, but still this remains the best market to approach them through, and we have the assurance of one of our first houses that they could place such cotton in Italy and the Continent. These are two samples of native cotton (one native-ginned, the other unginned), brought home by Mr. FitzGerald."

*Cotton in the Witu District.*[1] *Extract from District Officer's Report.*

"*November* 1893.

"*Native Cotton* is grown on the mainland opposite Faza at the following places—Samabaya, Mattaroni, Vundeni, Sumeyie. In Lamu it is used chiefly for stuffing mattresses, pillows, etc., owing to the absence of demand for other purposes. The quantity exported during the period from July 1, 1891, to October 31, 1893, is 586 frasilas.

"*Cotton Seeds.*—I am informed these are used as food for milch cattle in Lamu, and the quantity exported from here during the period from July 1, 1891, to October 31, 1893, is 4217 frasilas. Native cotton and cotton seeds are usually shipped to Zanzibar, Aden, and Bombay."

*Extracts from Letters from Mr. J. Weaver, Magarini Plantations.*

"*August* 24, 1893.

"I am sorry to say the staple is very short; it is like combed lamb's wool, and is quite free from the seed; in fact, the latter would almost drop out by shaking the cotton well. . . ."

"*October* 10, 1893.

"I had good hopes of a grand crop, but the trees are in a much worse state than last year, and the pods are bursting while small and green from the drought. Cotton planted on the new land at back of Magarini does not thrive if planted when the rains are on; but one acre planted as an experiment with the last rain does very well up to the present. Also half an acre of 'New Orleans,' planted at the same time, does exceedingly well; in fact the trees show up much better than the 'Sea Island.' The cotton planted last year on the *sea-*

[1] See also Report on "The Cultivation of Cotton in the Witu District." Foreign Office Miscellaneous Series, No. 251, for 1892.

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*ward side* of Magarini Hill is suffering very much from the extreme drought. . . . In returning lately from Mombasa, I landed at Kilifi, and walked up, and in passing Roka, I noticed some wild cotton that was looking extremely well, and on examining it, found it to be 'Kidney Cotton,' otherwise known as *G. Peruviana.* Please notice, from the small sample sent, the peculiar arrangement of the seeds—they are like kidneys. It grows well, but the staple seems short."

### *Mr. Weaver's Remarks on Cotton Cultivation on the Magarini Plantations.*

"*Cotton.*—By the spring of 1893 we were able to bring the area under cotton up to 200 acres, of which 90 acres were planted in the previous year. By the end of 1893 a small picking of cotton took place, and was continued until the spring of 1894. As far as I can remember, the amount of cotton picked averaged 80 lbs. of clean cotton per acre. This was ginned in the machine sent out from England, at the rate of about 100 lbs. of clean cotton per day. The cotton as picked in the field yielded about 33 lbs. of marketable fibre for every 100 lbs. passed through the ginning-machine, the remaining 67 lbs. consisting of cotton-seed; this seed was eagerly sought after by the Indian merchants for feeding their milch cows. I found that the natives did not take sufficient pains to keep the fibre clean, they generally got a lot of dirt, such as dried leaves, etc., into their bags along with the cotton, and this rendered it necessary to 'bow-string' the cotton after ginning. I found the Nubians very expert at all work connected with cotton cultivation: they were exceptionally smart at 'bowing.' Cotton ginned and then 'bowed' was thoroughly clean, and presented a superior appearance. Sea Island cotton so treated was sent to Europe for disposal, and realized 8*d.* per lb. on the market; other Sea Island cotton, from America and elsewhere, of the highest quality, offered for sale at the same market at the same time, realized 8½*d.* per lb. Towards the end of 1893 and in the spring of 1894, during the hot weather before the rains, the cotton plants were attacked by an aphis,[1] and considerable damage was done to the

[1] "The cultivation of cotton in the United States has gone through a curious change with regard to the depredations of insects. Not very long ago, the average annual loss to the cotton-growers from the work of a single species of insect amounted to 15,000,000 dols. This insect was the so-called cotton caterpillar, or cotton-leaf worm (the larva of *Aletia argillacea*, Hübn.). Down to the year 1881 the damage done by

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plants, the leaves of which were entirely eaten up. After some delay the plants were sprayed with a mixture of 'London Purple' and water, but too much damage had already been done; the plants did not recover their usual vigour. The season 1893-94 was not very favourable; in fact it was decidedly dry. No attempt was made in 1895 to replant the ground with cotton.

"In addition to our trouble with the aphides we had considerable bother with our labour; the released slaves found that they could earn more by cultivating their own plot of land than by continuing to work on the cotton plantation at the rate of pay we could afford to give them. The Wanika labourers, we found, were always busy on their own plantations at the time we most urgently needed them.

"Also in the early part of 1894 we were troubled with a plague of locusts, which were very destructive not only to the cotton but to the coco-nut trees. This plague destroyed the 'Makuti' (coco-nut leaves), and also ate up all the leaves of the cotton plants. I found that 'London Purple' was very efficient in keeping the locusts away from coco-nut trees."

### *Cotton grown on Magarini Plantations.*

*Broker's Report.* "*May* 1894.

"*M*1*P*., *M*3*P*.—These two samples are decidedly attractive; the staple is good, fine, and strong. We submitted them to one of the most practical of the Bolton spinners of fine cotton, and he fully endorsed what we had decided to write; he remarked that the soil was evidently good, and that owing to the great care and the goodness of machinery employed in preparation of the lint, it would be to the grower's interests to sow the best seed obtainable. We consider these two samples superior to the present offerings of Tahiti-grown cotton, but they will not command the prices of the better growths of Sea Island Perus, which are at present offered at about 9*d*.

this insect so far exceeded that inflicted by any other species that other forms had received but little consideration. Since about 1880, however, the cotton-worm has ceased to be a serious enemy to cotton. It is undoubtedly much less abundant and destructive than it was fifteen years ago, and no longer holds the first position among the insect enemies of the cotton crop. The so-called bollworm (the larva of *Heliothis armiger*, Hübn.), which a few years ago did much less damage than the cotton-leaf worm, now ranks as the most prominent enemy. It is curious to note this decline of one harmful insect and rise of another. Students of biology will remember many similar instances."—Mr. L. O. Howard, in *Bulletin* published by the U. S. Department of Agriculture.

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per lb.; we therefore have decided to send you the valuation of 8½*d.* to 9*d.* per lb. for these two samples.

"*M4P.*—This sample shows good preparation, but it is very short in staple; we think its value is about ½*d.* per lb. below that of 'good Mid Orleans,' and would upon this basis be worth 3⅞*d.* per lb.; but this is only an estimate, as it is impossible, even for a spinner, to tell the value of a new growth such as this without the actual experience of testing it by machinery. Owing to the scarcity of the high grades of Surat, there is very little clean, well-prepared cotton offering under 4*d.* per lb., and this fact supports our basis of valuation notwithstanding that the staple is so short.

"101/104 *Bales.*—This sample indicates a bright, well-prepared cotton, but lacking in fineness of staple and uniformity of strength, some fibres breaking 'strong,' and others lacking this essential feature; we think 8*d.* to 8½*d.* per lb. is about the value of this parcel.

"*Nos.* 1 to 6:—6 *Bales.*—These six bales are very brown in colour, but not evenly so, showing a striped appearance, which, with most spinners requiring regularity of colour, would be an important objection. It, too, is uneven in length, and also lacks uniformity in strength. We do not think it prudent to value this lot higher than 4*d.* to 4½*d.* per lb.

"1 *Mat of Cotton.*—This lot is the most difficult to value, as in appearance it resembles the other well-prepared lots, but shows considerably more variety in length, strength, and fineness, some of it being decidedly weak and rough; we do not think it safe to put more than about 5*d.* per lb. on this parcel."

### *Cotton from Kismayu (Juba River).*

*Valuation.* "*January* 1892.

"No. 1.—Fair rough African. Mixed with a good deal of stain, and rather leafy. Value in the present state of the market about 4*d.* per lb.

"No. 2.—Rough African, but shorter in staple, seedy and dirty; about 3*d.* per lb."

## COTTON-SEED.

*Broker's Report.* "*Liverpool, June* 1894.

"*Sample of Cotton-seed.*—The value of same is about £5 10*s.* per ton. . . . The above sample is of fair merchantable quality, but there are a good many light brown seeds apparently picked unripe, in which there is no oil, and we

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think the proportion of the latter is rather over 5 per cent."

The following is a *Marseilles* report on this same seed—"The quality of this seed is very good, and a large business could be done at suitable prices; but all seed prices are presently very low, and the valuation of day value is about 14 to 15 francs per 100 kilos delivered at Marseilles. The best time for sale of this quality of seed is September to October."

## DARI, METAMAH, OR MILLET.

(Commercially known as *Dari*.)

*Valuations.* "*June* 1892.

No. 1. "We are pleased to advise sale of your shipment at 18*s.* 6*d.* per quarter of 480 lbs."

"*August* 1893.

No. 2. "We have examined sample of one case of decorticated millet seed, and find same of good merchantable quality, and worth £4 per ton on wharf. A small parcel on the spot was sold this week at an equivalent of £4 to £4 2*s.* 6*d.*"

## EBONY.

*Report.* "*September* 1893.

"This wood is not the genuine ebony, but a wood known here as *African Blackwood*, or *Mozambique Ebony*, for which there is but very little demand; the pieces should be hewn free from bark or sap, 6 inches in diameter, sound and free from knots, which would then be worth about £14 per ton."

## GUM ARABIC.

*From Kismayu District.*

*Report.* "*London, January* 1892.

"We have carefully examined the two samples of gum arabic handed to us, and find them to consist of very weak, gutty, and partly insoluble gum. The value of this description is very low, and sale is uncertain. As far as we can at present judge, we are afraid it would hardly pay to ship, but we have forwarded a portion of the sample to the largest user of this kind of gum, asking if he could use it at all, and at what price. We will communicate further with you."



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## GROUND-NUTS.

*Report.* "*Marseilles, January* 1894.

"*Ground-Nuts.*—We are doing a large business with Bombay and Coromandel, and therefore well conversant with this kind of business. The kernels of East Africa (Mozambique, etc.) are much in favour and the best paid. . . The article *ground-nuts* is of the greatest importance for our market, and we can safely advise your friends to do business in this article."

*Valuation.* "*London, May* 1894.

"Your shipment of ground-nuts has arrived at Marseilles, and the report from there is that on examination of the sample, the kernels were found to be of very good quality, and could be utilized in the drug trade, which pays better than the oil trade, and they are valued at 31 francs per 100 kilos, this being the quotation for Mozambique ground-nuts."

## GUM-COPAL, OR ANIMI.

*Report.* "*March* 1891.

"*Gum Animi, called Copal, from Takaungu District.—Red,* what is understood in London as Zanzibar Animi. The quality of most of it is good, being pale and strong. . . The value varies according to size, viz.—

"*Cleaned Gum.*—Bold pale, £13 to £14 per cwt.; thumb pale, £11; bold red, £11; thumb red, £8; bean and pea, £6 10*s.* to £8 per cwt.

"*White, soft, weak Gum.*—Value also according to size; bold, £7 to £8; small, £5 to £6; bean and pea, 60*s.* to 80*s.* per cwt."

## INDIARUBBER.

### *Reports on East African Rubber.*

"*London, July* 1890.

No. 1. "Mozambique character, spun ball clean, but rather green or white, present value, 2*s.* 4*d.* to 2*s.* 5*d.* per lb. All qualities are saleable; but 'clean,' *i.e.* free from 'sand' or 'dirt,' are in *most* request, and consequently of more ready sale. We should strongly urge on friends in Africa the necessity of obtaining 'clean' rubber. This class of rubber, 'spun ball,' as represented by your sample, if 'red,' *i.e.* 'strong,' would bring 2*s.* 6*d.* per lb., our highest value for the moment for the best Mozambique ball."

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"*December* 1890.

No. 2. "We have now tested the sample of Mozambique 'ball,' and congratulate you on the marked improvement it shows on any samples we have seen of this class of rubber for some time back. It shows a decided improvement in the care with which it has been collected; and the curing is also decidedly better. The only fault we have to find with it, is in its *greenness*, which will affect its commercial value; but that is a point which can be overcome, and we have hopes that with still greater care bestowed, we shall see the rubber come to market in as good a state as Pará."

No. 3. "*Indiarubber.*—Ball fine, free from sand or wood; this quality *is very desirable;* so much of the rubber which comes is so mixed with sand and wood or barky substance, which reduces the value to a great extent. Such as yours, owing to the market being very firm, would bring 2*s.* 5*d.* to 2*s.* 6*d.* per lb."

"*June* 1892.

No. 4. "There is just one suggestion I would venture to make, the importance of which you should not fail to impress upon your friends, and that is respecting the methods and art of collecting and curing the rubber milk. The milk should be gathered and kept in its pure state, and promptly and thoroughly cured, that is to say *daily*, this preventing the risk of decomposition. By such methods a superior result may be obtained, the condition and quality of the production being very much more valuable in the home markets than most of the present productions, which are badly cured, loaded with all sorts of impurities; and besides, very often carrying 10 to 40 per cent. of water."

"*September* 1892.

No. 5. "We are pleased to advise having sold your rubber at very high prices, obtaining in each case considerably above the value that we and our brokers had put upon the shipments, but little or no difference was made in buyers' offers between the parcels from Mombasa and Lamu."

### *Indiarubber in the Witu District.*

*Extract from Report of District Officer.*

"*Lamu, November* 1893.

"I have the honour to acknowledge receipt of your letter dated September 26, enclosing copy of one received by you from the Secretary requesting certain information regarding the export of indiarubber from this port.

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"In reply, I beg to report as follows, and to state that the information given applies to the period from July 1, 1891, to October 31, 1893.

*Rubber* exported from Lamu during year ending

| | |
|---|---|
| June 30, 1892 ... ... ... ... ... | 12,252 lbs. |
| Ditto, year ending June 30, 1893 ... ... ... | 43,910 „ |
| Ditto, for four months ending October 31, 1893 ... | 24,832 „ |

"I would beg to point out that after the heavy rains of last season, a large quantity of rubber was expected, but owing to the unsettled state of Witu territory, the collection of this product was almost altogether stopped except along the coast-line. As you are aware, the forests near Jongeni are the main sources of the rubber exported from here.

"The following are the places in the district from which rubber is imported into Lamu—

| | | |
|---|---|---|
| Kismamanyanui. | M'Pekatoni. | Shimbwe. |
| Panda Nquo. | Jongeni. | M'Tapani. |
| Bindarani. | Pumwani. | Kilimandaro. |
| Katawa. | Itembe. | M'Paya. |
| Bakhetima. | Wasin. | Wange. |
| Gavira. | Kiangwe. | Ingeni. |
| Safareh. | Dodori. | |

"A separate record has not been kept of the quantities received from each of the above places, and I regret the information asked for on this point cannot be supplied."

*Extract from Spon's Encyclopædia on African Rubbers.*

"Much ignorance still prevails concerning the sources and collection of the African rubbers. The Mozambique and Madagascar kinds are obtained from the climbing shrubs *voa-here* or *voa-canja* (*Vahea madagascariensis*), *voa-hine* (*V. comorensis*), and *V. gumifera*. The product of one of these species is said to be much superior to the others, but all are mixed indiscriminately by the natives. The preparation consists in treatment either with salt water or artificial heat. The Mozambique article occurs in orange-like balls; in 'sausages,' formed of slender strings of rubber wound upon a stick, which is finally withdrawn; and occasionally in smooth pieces of various size termed 'cake' or 'line.' The Madagascar sort consists of shapeless lumps, the better quality having a pink colour and the lower a black.

"Some rubber is produced in Mauritius by *Cryptostegia grandiflora*, and some by *Willughbeia edulis*, the latter found also in Madagascar, Chittagong, and Silhet.

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"A belt of rubber-yielding plants of different species extends across Tropical Africa from ocean to ocean. Within 20 miles of the coast from Liawa and the Lindi estuary (Masasi and Rovuma, E. Africa, 11° S., 38° E.), the forest becomes almost entirely formed of indiarubber vines, affording an abundant supply of fine rubber, at present gathered only in a very desultory manner by the natives, who gash the plants, and collect the exuding juice, which issues in a liquid form, and dries hard after short exposure to the air. Rolled into orange-like balls, it is taken to Lindi, where it is purchased by the Banyan merchants at about a quarter its value. Dr. Kirk has determined the plant which yields the best E. African rubber, and has obtained seeds of the species for introduction into India. It occurs in great abundance along the newly-made road from Dar-es-Salaam, in a W.S.W. direction, for about 100 miles towards the interior of E. Africa, through the Wazamaro country; it is apparently but little affected, except in the immediate neighbourhood of the villages, by the reckless mode of tapping employed. In many parts a native can still collect 3 lbs. of rubber daily. *There are five species*, but only one is considered worth tapping. Specimens received from him at Kew have been named *Landolphia florida* and *L. Kirkii*, the latter of which yields the best rubber. Landolphia vine is known from Pangani inland all the way to Handei (in Usambara, E. Africa); at Magila the rubber is made into balls for export. Dr. Kirk states that *L. owariensis* is common along the maritime region of E. Africa, and abundant at the mouth of the Zambesi, being found largely at Shupanga on that river at 100 miles from the coast. The produce of this has been shipped from Quillimane for America. The natives of the Marutse-Mabunda empire, on the Upper Zambesi, trade in rubber with the tribes to the west. The district called Mungao, extending from S. lat. 9° 25′ to Delgado in 10° 41′, yielded £90,000 worth of rubber in 1877, when the industry had been only three years in existence. In 1878 Kilwa and Mombasa added largely to the supply. On the Victoria Lake are one or two kinds of tree-producing rubber of good quality. Rubber plants grow on the slopes of the Cameroons mountains (W. Africa), but the people do not yet know their value. Rubber trees abound on the river Djour in the province of Bahr-el-Ghazal.

"The *Landolphia spp.* are principal among the rubber plants of W. Africa. The rubber is collected from *L. owariensis*, extending from 10° N. to 10° S. on the coast of

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W. Africa, and most abundant in the highland districts of Angola; *L. florida*, frequent in inner Angola up to 1500 to 2500 feet, and in Liberia; and *L. Heudelotii* in Senegal. According to Speke and Grant, the natives say that the best rubber is produced by *L. florida*. The plants of this genus are woody climbers, growing well in damp rocky ravines scarcely available for other culture. Being climbers, they could not be grown in separate plantations, but would probably flourish in any tropical jungle, where trees already existed for them to ascend. Every part of the stem exudes a milky juice when cut or wounded, but this will not run into a vessel placed to catch it, as it dries so quickly as to form a ridge on the wound, which stops its further flow. The blacks collect it by making long cuts in the bark with a knife, and as the milky juice gushes out, it is wiped off continually with the fingers, and smeared on their arms, shoulders and breast, till a thick covering is formed. This is peeled off their bodies and cut into small squares, which are then said to be boiled in water. According to other accounts, the natives cut off a piece of the bark, and the milky juice is allowed to run into holes in the ground or upon leaves. In some districts they simply let the juice trickle on their arms, going from tree to tree till sufficient has accumulated, then peeling it off from the elbow in the form of a tube. Elsewhere it is said to be collected and left to inspissate in wooden vessels. Collins remarks that if the incisions be allowed to penetrate too deeply, they liberate a gummy substance, which mingling with the rubber depreciates its value. These vines may be tapped for rubber when *three years old*. Christy suggests their cultivation in plantations, and annually cutting down the young shoots almost to the ground, then crushing the stems between rollers, and treating the whole mass with carbon bisulphide, which dissolves the rubber, but not (he says) the injurious gummy matter. The rubber of these vines is of fairly good quality when carefully prepared. It should be made in separate sheets or cakes, one or two inches thick and six inches or so in diameter. Iron or stone vessels are superior to clay for collecting the juice. The better kinds are said to be prepared with the addition of three per cent. of strong *liquor ammoniæ*. When any liquor is added in the preparation, the sheets must be very thin to facilitate drying. *This question of drying seems to have much to do with the quality of the rubber, and the inferiority of* African to Para rubber is largely attributed to its being sent into commerce *in a raw, green state, whence*

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*possibly also arises its disagreeable odour, generated by decomposition.* The desirability of introducing the *Attalea excelsa* for the purpose of employing its nut (the *urucuri*) in curing African rubber as in Para (see p. 1661), has even been discussed; but the slow smoky fire from any oily nut would probably have the same effect.

"Another important W. African plant is *Urostigma Vogelii*, with possibly some other species. The tree (20 to 30 feet) grows near the sea at elevations of 50 to 60 feet, but does not flourish in marshy ground. The natives pollard the trees at 10 to 12 feet and cut back the branches, thus obtaining a free and regular flow of sap. The cuttings are easily propagated, and grow vigorously. The trees are tapped at about five years by making slashes or incisions in the trunk; the juice is collected in a vessel, inspissated by the use of acids, and made up into balls the size of a large orange. Though often sent in a dirty state, the rubber is of good quality, and said to be the best of the Liberian. The juice obtained from trees less than five years old is watery, and does not afford such good rubber. Christy considers this a desirable species for cultivation in the lowlands of S. India, Ceylon, Java, Sumatra, Penang, and Siam.

"A considerable proportion of W. Africa rubber is obtained from a plant which Holmes has determined to be *Tabernaemontana crassa.* In Senegambia the Anjouan (*Vahea Senegalensis*) contributes to the supply. In Sierra Leone rubber is collected from *Ficus Brasii;* and some *Ficus spp.* yield it in Angola on the west coast and at Inhambane on the east. A specimen of rubber from the west coast of Africa is attributed to an undescribed species of *Carpodinus;* and in Réunion, some is said to be derived from *Periploca Graeca.*

"The rubbers sold under the general name of African, omitting Mozambique and Madagascar, occur as shapeless lumps ('knuckles') from the Congo; 'negro-heads' or 'balls' of scrap, and smooth cakes from Sierra Leone; 'thimbles,' 'nuts,' and 'negro-heads' from the Portuguese ports; 'tongues' from the Gaboon; and 'balls' from Liberia. The African rubbers are more adhesive and less elastic than the Para article, and command a lower price. The inferiority could be much reduced by an improved system of preparation."[1]

[1] Spon, *Encyclopædia of the Industrial Arts, Manufactures, and Commercial Products.*

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## JUTE.

*Cultivation of Jute on Sabaki and Tana Rivers.*

"*February* 20, 1892.

"TO THE ADMINISTRATOR-GENERAL, MOMBASA.

"SIR,

"As instructed in your letter of the 30th ult., I have the honour to annex the following report on above. . . .

"The cultivation is not difficult, and could easily and readily be carried on by the natives, care only being required—

"1. In cutting the plant at the proper time.

"2. In testing the fibre when submerged.

"Being identical with the *Cotton-plant* in its requirements, there can be no doubt of the suitability of jute for cultivation in this country, and more particularly in the districts bordering upon the Sabaki river; I speak from personal observation of the soil and capabilities of these districts, and there must be many more suitable localities in the Company's extensive territory well adapted for its cultivation; I would instance the *Tana district.*

"The results of a small experiment, which I would recommend should be carried out at Jelori, would be highly interesting; the only question which arises concerning the cultivation of jute in the Sabaki district is whether the permanent yellow discolouration of the Sabaki river would have an injurious effect upon the quality of the fibre.

"I have the honour to be, sir,

"Your most obedient servant,

"(*Signed*) W. W. A. FITZGERALD."

## KAPOK, OR TREE-COTTON.

*Report.* "*March* 1891.

"Melindi district, good quality, silky and bright, but a good deal of seed. Value, as per sample, 3½*d.*; if free from seed, 4½*d.* to 5*d.* per lb."

## MAIZE.

*Reports.* "*London, May* 1892.

No. 1. "We are pleased to advise sale of your shipment of *maize* at 20*s.* 6*d.* per quarter of 480 lbs. The price of maize varies considerably, but if parcels can be laid down here to cost not more than 19*s.* to 20*s.* per quarter, we think they ought, under ordinary circumstances, to realize these prices."

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"*June* 1892.

No. 2. "We have to advise having sold the maize at 19*s.* per 480 lbs., the broker's report upon which was—'Small and large mixed, weevilled.' We may mention that upon the day of sale of the maize, Galatz was bringing 20*s.* 9*d.*, and Danube 20*s.* 3*d.*"

"*December* 1893.

No. 3. "We have the pleasure to advise you of the sale of your shipment maize at 19*s.* per 480 lbs., which we consider a good price, the best qualities of maize value to-day being as under—

| | | | | |
|---|---|---|---|---|
| *Cinquantina* ... | ... | ... | ... | about 22*s.* 6*d.* |
| *Galatz Toxanian* | ... | ... | ... | „ 20*s.* 9*d.* |
| *Mixed American* | ... | ... | ... | „ 20*s.* 0*d.*" |

## ORCHELLA WEED.

*Valuations.* "*London, March* 1891.

No. 1. "*Orchella Weed Sample.*—All of fair quality, and the very best value would be from 18*s.* to 20*s.* per cwt."

"*January* 1892.

No. 2. "*Orchella Weed.*—We make the sample of orchella weed, so far as we can judge, good, fair quality, and worth about 22*s.* to 23*s.* per cwt."

## OLIVE CULTIVATION.

*Extract from Letter from Sir John Kirk.*

"As to the introduction of olive-plant to the Malindi district, I may mention that the olive has been tried in the island of Zanzibar and has there proved a failure; the tree grows to a good size, but the fruit is small and worthless. I do not think it is worth while to repeat the experiment until we have an acclimative garden in a cooler district than Malindi.

"In any case, unless the olive trees that grew in the Sultan's garden at Narimoja in Zanzibar have been destroyed, I would recommend getting plants there. The olive is easily propagated and in several ways. There are good papers on its cultivation published in Australia, by which I was guided when experimenting on the growth of the tree with a view to its growth in Zanzibar. I left at my private experimental

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garden at Zanzibar plants of nearly all the tropical fruits and products; I have no doubt they are there still, but probably no one knows what they are. Some trees grow very well, such as the logwood, mahogany, cinnamon, cassia, nutmeg, Liberian coffee, Paraguay tea, Ceará and Pará indiarubber trees, etc., etc. Eucalyptus of three kinds grew splendidly; I left one tree 112 feet in height. There were also nearly all the tropical fruits, and many useful things, such as the Brazil nut and fancy palms.

"What we really need on the coast is to have a trained Kew gardener, at about £200 salary, in charge of an experimental garden, which would be the nursery for the issue of seedling plants for general distribution; four acres of ground would be more than ample; my private garden was forty acres, but it was laid out as pleasure-grounds as well. A nursery garden would be most valuable; but to be of use, it must be under the care of a resident gardener, who can devote his continuous attention to it.

"JOHN KIRK.

"*March* 25, 1892."

## OSTRICH FEATHERS.

| *Valuation.* | lb. | oz. | | *November* 1894. |
|---|---|---|---|---|
| 7 feathers, wgt. | | 8 | White short part bloods | value 50*s.* per lb. |
| 1 „ „ | | 5 | „ „ quilly | „ 45*s.* „ „ |
| 3 „ „ | 1 | 7 | Third white femina and spadovas | „ 10*s.* „ „ |
| 2 „ „ | | 9 | Boos and third boos | „ 5*s.* „ „ |
| 2 ty „ „ | | 8 | Mediums and short black | „ 6*s.* „ „ |
| 2 „ „ | | 13 | Loose black | „ 1*s.* „ „ |

Above realized £6 at public sale.

## RICE.

*From Gosha on River Juba, Kismayu District.*

"*London, January* 1892.

"1293. Sample of paddy, apparently of Java kind. It is a very bold even grain paddy, slightly mixed with discoloured grains. Difficult to sell, but if imported and cleaner on shipper's account would probably yield in cleaned rice equivalent to *7s. 6d.* per cwt. for the paddy.

"1294. Cleaned rice, apparently of Java kind. Middling bold grain, even dull grey-white colour; some maggots in sample. Nearest valuation, 11*s.* per cwt. Would sell readily at this moment in the absence of stock of Java or Japan rice."

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## SIMSIM, OR SESAME.

*Valuation.* "*London, January* 1891.

"This is also favourably reported upon, and it is worth on the spot about 45*s.* per quarter of 384 lbs."

## SKINS.

*Report.*

"We value the skins you sent us as follows—

Deer skins, about 1*s.* 6*d.* each.
Leopard skins, about 2*s.* 6*d.* and 5*s.* each.

"They are very badly wormed, and tender and badly patched. Giraffe hide only suitable for glue, pieces worth about 2*d.* to 1*s.* 2*d.* per lb."

## TOBACCO.

*Report.* "*January* 1891.

"We have to report as follows on the parcel of samples received from Mombasa—

"*Tobacco.* Our brokers report as under—

"'We have carefully examined the samples of East African tobacco, and find them different to anything hitherto imported into this country, at least the sample from *Taveta.*

"'The leaf in this sample, evidently packed by natives, is very small and scrappy, and therefore only fit for fillers. It would be interesting to see the full leaf carefully packed straight. For export to the Continent this tobacco as at present put up would be useless, as, on account of the stalk being removed, it would be classed as manufactured, and therefore liable to the duty. As the tobacco we find will not burn, it is useless for cigar purposes, but it might do for cutting if mixed with other growths. The flavour is particularly good, and we fancy it may be accounted for by the seed being Virginia, or, what seems also very probable, the flavour may be artificial. We value the tobacco at from 3*d.* to 3½*d.* per lb.

"'The other sample, a native roll, is quite useless, and utterly unsaleable. We shall be happy to give you any further information you may desire. If of any interest to you, we should be glad to show you samples of leaf tobacco grown in West Africa, worth nearly as many shillings per lb. as we quote yours pence.'"

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*Report on Native-grown Tobacco from the Sabaki Valley.*

"*London, June* 1891.

"The plait which we have now opened is composed of all sizes of leaves, from some fairly good to others merely scraps. The tobacco is generally mouldy and out of condition, and is therefore not worth our very heavy duty, nor is it in its present heated state fit for cutting up for smoking.

"The simple plait of tobacco has evidently been made up by native or inexperienced hands, and nothing can be done with tobacco in this country until it is properly packed and in a fit condition to compete with that sent over from America and elsewhere.

"In the first place it should be far more carefully dried and fermented, and handled in such a way that the leaves are torn and damaged as little as possible.

"Secondly, the leaves should be packed flat and in their natural shape, instead of being plaited."

*Report on the Indian Tobacco Industry.*

The following report, from *The Times* of February 27, 1896, applies with equal force to British East Africa—

"Mr. Tripp, in his lecture, pointed out that the three essential factors to the successful pursuit of the tobacco industry were *soil, climate*, and *skilled labour*. Sumatra, possessing all three in an eminently favourable degree, was enjoying an amount of prosperity which was perhaps unequalled in any other part of the globe. India's natural advantages of soil and climate, though inferior to those of Sumatra, might be turned to excellent account if skill, experience, and more capital were bestowed upon the industry. The further advantage possessed by India of an abundant supply of native labour, of which neither Borneo nor Sumatra could boast, ought, if skilfully utilized, to give her a place among tobacco-producing countries to which she had not hitherto become entitled. If the planters of India and Borneo would only pay more attention to those factors in which they were deficient, he felt convinced they could improve the produce to such an extent that it would in time become a source of wealth, not only to themselves, but to the countries within whose areas their estates were placed. The wants of the average smoker of average means in this country were now supplied for the most part by the continent of Europe, which sent over something like 80,000,000 cigars every year. But, in spite of all the discouragement it

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met with, the British cigar industry was making rapid strides. When the prejudice against home-made cigars could be removed, and India and Borneo were recognized as first-class tobacco-producing countries, it would then be possible to see cigars grown on British soil with British capital and made by British hands. The lecturer illustrated his paper with a series of lantern slides depicting the culture, fermentation, and manufacture of tobacco in Sumatra. Mr. Strutt, M.P., Sir G. Birdwood, and others, also took part in the discussion that followed."

## WHEAT AND BARLEY

*Report on samples from Kikuyu.*

"*January* 1894.

"We have received your samples of African produce, and now beg to report upon same as follows—

"*Wheat.* Large berry, hard and mixed; value, about 22*s.* per 496 lbs.

"*Beardless Barley.* Nice quality suitable for malting, 28*s.* per 448 lbs.

"*Chevalier Barley.* Nice quality suitable for malting, 27*s.* per 448 lbs. ex store.

"The above quotations for the barley are subject to the bulk arriving quite equal to samples, and free from weevil. Should the barley be weevilled it would be unfit for malting, and would not realize within shillings of above quotations. We mention this, as African produce invariably arrives home more or less weevilled."

## VARIOUS SAMPLES BROUGHT HOME BY THE MOMBASA-UGANDA RAILWAY SURVEY.

*Note.*—The numbers in brackets denote the *Uganda* samples.

*Report.* "*December* 1892.

"We have examined the various samples of African products which you sent us, and beg to report upon them as follows—

"No. 5. Millet seed; value to-day, about 16*s.* or 17*s.* per 480 lbs. ex store.

"Nos. 1, 3, 6, 9. Unknown seed, but only fit for grinding into meal for cattle-feeding. Value, about £3 per ton ex store.

"We enclose separate letter with report upon the four samples of flour—'We have carefully examined the samples of *flour* sent us, and have to inform you that they are unsuit-

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able for baking purposes, and for cattle-feeding they would be worth as under—

| | | | | |
|---|---|---|---|---|
| say No. | 5 | *about* | £4 | per ton. |
| „ | 3 | „ | £3 10*s.* | „ |
| „ | 2 | „ | £3 | „ |
| „ | 1 | „ | £3 | „ |

"No. 7. *M'tama* (Dari), better than No. 2; value, about 18*s.* per 480 lbs. ex store.

"No. 8. *Mahindi.* Nice maize; value, about 19*s.* per 480 lbs. ex store.

"No. 10. *Bazi.* Lupines, might do for seed, but impossible to quote.

"No. 11. *Kundi.* Not saleable in England.

"No. 12. *Kundi.* Red beans; value, from about 16*s.* to 18*s.* per 504 lbs. ex store.

"No. 13. *Kundi.* Red and white beans mixed; value, to 24*s.* per 504 lbs. ex store, but nominal, as qualities mixed are used for different purposes.

"No. 16. *Kundi.* Small and mixed. Value, about 16*s.* to 18*s.* per 504 lbs. ex store.

"(No. 2). *M'tama.* Dari. Very dark and small; about 16*s.* per 480 lbs.

"(No. 4). *Fuwi.* Beans, not suitable for this country.

"(No. 6). *Mburu.* Haricots; value, about 28*s.* per 504 lbs. ex store, but very little consumption here.

"(No. 7). *Mahindi.* Indian corn, small but useful; value, about 18*s.* per 480 lbs. ex store.

"(No. 10). Maize, larger with red grains; value, about 18*s.* per 480 lbs. ex store.

"(No. 11). Wheat, very fairly liked; value, about 28*s.* per 496 lbs. ex store, if free from weevil.

"(No. 13). *Beans.* Mixed Haricots; about 18*s.* to 20*s.* per 504 lbs. ex store.

"The above are nearly as possible the values of the articles, but at present time market is terribly depressed, and it is quite possible that in months to come all the articles might realize considerably more, especially the *wheat* and the *maize*, which are the principal wants of this country."

### *Report on Uganda Coffee.*

"*London, June* 1893.

"We now have the pleasure to hand you the report on the small sample of Uganda coffee, in cherry, which we received from you some time ago.

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"On peeling and husking a part of this sample, it appears to be composed of two distinct varieties, a few of the berries being of the ordinary African growth and of a yellowish colour, while the bulk is of much smaller size, with a greyish bloom on it; the bean itself is very hard, and has a strong, peculiar sweet smell. The sample has not been carefully prepared, but on the whole seems to have been fairly well dried, so the husk was easily removed. The present value is about 75*s.* to 76*s.* per cwt. We have recently sold a parcel of mixed Cassenga, shipped from the West Coast, at 73*s.* per cwt.

"We have shown this sample to other experts, who agree with us, that under careful cultivation and proper curing, on the same system that coffee is cured in India, the value could be considerably increased, probably to about 97*s.* to 98*s.* per cwt."

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# APPENDIX C

## METEOROLOGY OF BRITISH EAST AFRICA

IN giving permission for the reprint of the following extracts from the meteorological and climatological returns for British East Africa, published by the British Association for the Advancement of Science, Mr. Ravenstein writes thus:—

"*October* 6, 1897.

"DEAR MR. FITZGERALD,

"You are at full liberty to make use of any material collected and published by me, either as a private individual or as a Chairman of the British Association. We are *anxious* that this information, collected at great trouble to myself, should be utilized, and by doing this you confer a favour.

"I now send you our Reports for 1895, 1896, and 1897. I also send you the unpublished rain-fall observations for 1896, which have only just come to hand.

"Believe me, yours sincerely,

"E. G. RAVENSTEIN.

"W. W. A. FITZGERALD, Esq.

"Rain-fall for November 1896, quite unprecedented for *all* coast stations, but not in the case of those inland."

*The Climatology of Africa.—Fourth Report of a Committee, consisting of* Mr. E. G. RAVENSTEIN (*Chairman*), Mr. BALDWIN LATHAM, Mr. G. J. SYMONS, Mr. H. N. DICKSON, *and* Dr. H. R. MILL (*Secretary*). (*Drawn up by the Chairman.*)

[*Extracts.*]

Your Committee in the course of last year granted a complete set of instruments, including a mercurial barometer presented to them by the Meteorological Council, to the



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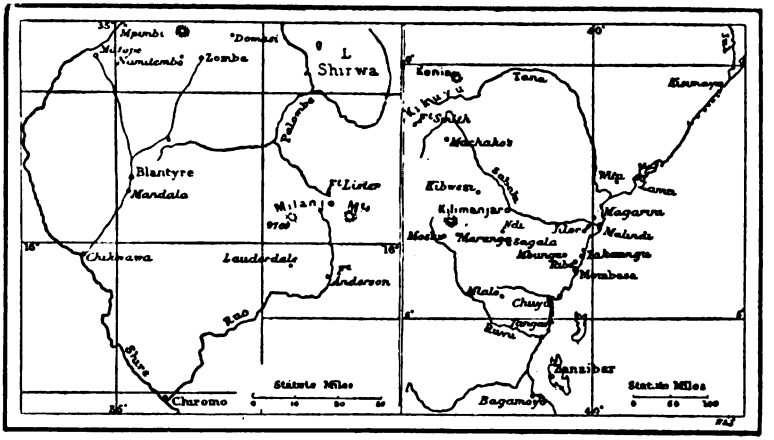
Scottish missionaries established at Kibwezi, on the road from Mombasa to Machako's. They also supplied Mr. Hobley, now in Uganda, with one of Symons's earth thermometers.

*Kibwezi, British East Africa* (Scottish Mission).—The instruments were only granted this year. One year's rain-fall observations have been received.

The sets at all the stations include a mercurial barometer, four thermometers, and a rain-gauge.

Meteorological reports from thirteen stations in British East Africa have been received. These stations lie on or near the coast, between Wasin and the Jub, and along the road connecting Mombasa with Fort Smith in Kikuyu, the climate of which is described as being exceptionally well




METEOROLOGICAL STATIONS IN EAST AFRICA.

suited to European residents. These observations were, in most instances, made by officials of the Imperial British East Africa Company. The abstracts have been prepared by the Chairman. (See Map.)

Your Committee regret that the instructions laid down for the guidance of observers should, in many instances, have been set aside, and that observations should have been made at hours precluding the possibility of deducing trustworthy means. Where circumstances do not admit of the instruments being read thrice daily—at 7 a.m., 2 p.m., and 9 p.m.—the thermometers should be read at 9 a.m., or twice daily, at an interval of twelve hours. The barometers, however, should be read at intervals of six hours—say at 9 a.m. and at 3 p.m.



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*Mombasa. Lat. 4° 4′ S., Long. 39° 42′ E., 60 feet. Observer: J. R. W. Pigott.*

| 1894 | Pressure of Atmosphere | | Temp. Extremes | | Mean Temperature | | | | | | | Daily Range | Variableness | Mean Temp. Wet Bulb | | | | Relative Humidity | | | | Rain | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10 a.m. | 4 p.m. | | | 7.30 a.m. | 10 a.m. | 1 p.m. | 4 p.m. | Max. | Min. | Monthly Mean | | | 7.30 a.m. | 10 a.m. | 1 p.m. | 4 p.m. | 7.30 a.m. | 10 a.m. | 1 p.m. | 4 p.m. | Amnt. | Days | Heaviest Fall |
| | In. | In. | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | pc. | p.c. | p.c. | p.c. | In. | | In. |
| January . | 29·802 | 29·682 | 85·0 | 76·0 | 80·1 | 82·2 | 83·1 | 83·1 | 83·5 | 77·5 | 80·5 | 6·0 | 0·7 | 77·3 | 76·7 | 77·1 | 77·6 | 85 | 77 | 75 | 77 | 0·16 | 2 | 0·12 |
| February . | 29·815 | 29·693 | 86·0 | 77·0 | 81·3 | 82·2 | 83·3 | 82·9 | 83·6 | 78·0 | 80·8 | 5·6 | 0·5 | 77·3 | 76·0 | 76·4 | 76·7 | 87 | 74 | 71 | 74 | 2·51 | 3 | 2·14 |
| March . . | 29·814 | 29·680 | 86·0 | 77·1 | 81·9 | 83·4 | 83·6 | 83·4 | 85·1 | 78·7 | 81·9 | 6·4 | 0·6 | 77·9 | 77·1 | 77·1 | 77·1 | 83 | 74 | 73 | 73 | 1·46 | 6 | 0·46 |
| April . . | 29·839 | 29·730 | 89·7 | 75·0 | 80·7 | 82·5 | 83·4 | 82·6 | 82·1 | 75·7 | 80·4 | 3·4 | 1·1 | 76·6 | 76·4 | 76·8 | 76·6 | 82 | 75 | 72 | 75 | 3·04 | 8 | 1·63 |
| May . . | 29·887 | 29·794 | 86·8 | 72·3 | 77·9 | 79·0 | 79·4 | 78·9 | 82·2 | 76·0 | 79·1 | 6·2 | 1·2 | 74·6 | 74·6 | 74·5 | 74·4 | 85 | 80 | 78 | 80 | 12·29 | 18 | 3·62 |
| June . . | 29·934 | 29·889 | 81·9 | 72·0 | 75·7 | 76·6 | 76·0 | 76·4 | 80·3 | 73·4 | 76·8 | 6·9 | 0·9 | 73·3 | 72·2 | 71·9 | 71·1 | 88 | 80 | 81 | 78 | 4·27 | 11 | 1·63 |
| July . . | 29·982 | 29·892 | 82·2 | 71·5 | 75·4 | 76·5 | 77·5 | 77·2 | 80·4 | 73·4 | 76·9 | 7·0 | 0·8 | 72·4 | 71·8 | 71·7 | 72·0 | 86 | 78 | 74 | 76 | 1·49 | 7 | 0·50 |
| August . | 29·971 | 29·879 | 83·8 | 71·5 | 75·8 | 77·4 | 77·7 | 77·2 | 80·8 | 73·7 | 77·2 | 7·1 | 0·8 | 72·3 | 72·2 | 72·0 | 72·0 | 84 | 76 | 74 | 76 | 1·33 | 9 | 0·40 |
| September | 29·957 | 29·850 | 82·9 | 71·8 | 77·3 | 78·5 | 78·9 | 78·3 | 81·6 | 74·9 | 78·2 | 6·7 | 0·4 | 73·5 | 73·0 | 72·6 | 72·6 | 83 | 76 | 73 | 75 | 0·29 | 8 | 0·70 |
| October . | 29·886 | 29·783 | 84·1 | 75·0 | 79·5 | 80·5 | 80·2 | 79·8 | 82·8 | 77·0 | 79·9 | 5·8 | 0·6 | 75·2 | 74·8 | 74·6 | 74·4 | 81 | 75 | 76 | 76 | 0·65 | 9 | 0·27 |
| | 9 a.m. | | | | | 9 a.m. | | | | | | | | | 9 a.m. | | | | 9 a.m. | | | | | |
| November | 29·851 | — | 86·0 | 74·1 | — | 80·8 | — | — | 83·6 | 77·8 | 80·7 | 5·8 | 0·6 | — | 76·3 | — | — | — | 80 | — | — | 7·59 | 19 | 1·18 |
| December | 29·825 | — | 84·1 | 74·0 | — | 80·5 | — | — | 83·0 | 76·6 | 79·8 | 6·4 | 0·6 | — | 75·6 | — | — | — | 78 | — | — | 2·88 | 2 | 1·53 |
| Year . . | — | — | 89·7 | 71·5 | — | — | — | — | 82·4 | 76·3 | 79·3 | 6·1 | 0·7 | — | — | — | — | — | — | — | — | 37·96 | 102 | 3·62 |

*Atmospheric pressure* reduced to 32° F. and corrected for gravity. In 1893 the results, for 10 a.m. were 0·006 in. higher; for 4 p.m. 0·026 in. higher. The pressure in both years was greatest in August.

*Mean temperature* assumed = ½ (max. + min.). Means for 1893 and 1894: year, 79° F.; Jan. 80·1, March 82°, July 76°·6; mean daily range: 6°·4 F. (April 5°·2, June 7°·2).

*Variableness* (mean difference in the daily means from day to day): mean, 0°·7 F.; mean of the extremes in each month, 2°·5 F. The observations recorded by Mr. Pigott inspire confidence. Instrumental errors, however, are not known.

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*Chuyu.* *Lat.* 4° 30′ *S.*, *Long.* 39° 21′ *E.* *Observers:* *K. MacDougall and R. C. Fobo.*

| 1894 | Pressure of Atmosphere | | Mean Temperature | | | | | Rain | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 10 a.m. | 4 p.m. | 7.30 a.m. | 10 a.m. | 1 p.m. | 4 p.m. | Approx. Monthly Mean | Amount | Day | Heaviest Fall |
| | In. | In. | ° | ° | ° | ° | ° | In. | | In. |
| January . | 29·804 | 29·710 | 80·4 | 83·1 | 83·7 | 83·2 | 82·0 | — | — | — |
| February . | ·844 | ·715 | 81·7 | 83·6 | 85·3 | 84·2 | 83·5 | 2·05 | 3 | 1·61 |
| March . | ·848 | ·726 | 79·5 | 84·4 | 83·5 | 82·6 | 81·5 | 2·12 | 7 | 0·93 |
| April . | ·895 | ·779 | 79·3 | 80·9 | 81·3 | 81·6 | 80·3 | 2·63 | 6 | 1·50 |
| May . . | ·936 | ·833 | 76·4 | 78·7 | 77·7 | 78·1 | 77·0 | 10·81 | 17 | 2·58 |
| June . . | 30·049 | ·932 | 74·4 | 75·9 | 76·3 | 76·4 | 75·3 | 5·54 | 19 | 1·43 |
| July . . | ·034 | ·945 | 73·7 | 75·0 | 75·6 | 75·7 | 74·7 | 4·19 | 11 | 1·30 |
| August . | ·016 | ·916 | 74·3 | 75·4 | 75·7 | 75·8 | 75·0 | 2·05 | 3 | 1·17 |
| September | 29·996 | ·878 | 75·6 | 77·9 | 77·6 | 77·8 | 76·6 | 0·16 | 1 | 0·16 |
| October . | ·933 | ·821 | 78·0 | 79·8 | 79·9 | 79·9 | 78·9 | 0·11 | 2 | 0·09 |
| November | ·899 | ·834 | 78·7 | 80·4 | 81·3 | 80·8 | 80·0 | 7·42 | 15 | 1·43 |
| | 9 A.M. | | 9 A.M. | | | | | | | |
| December | 29·881 | — | 80·6 | — | — | — | 80·6 | 4·94 | 7 | 1·62 |
| Year . . | — | — | — | — | — | — | 78·8 | 42·02 | 91 | 2·58 |

Chuyu lies on the mainland, opposite Wasin Island.
Pressure of atmosphere reduced to 32° F. and corrected for gravity. Temperature: The mean assumed = ½(7·30+1). Extremes recorded during the year: 71° and 87°5 F. Rain-fall: No entries for January; perhaps no rain fell.

*Malindi.* *Lat.* 3° 13′ *S.*, *Long.* 40° 7′ *E.* *Observers:* *D. Macquarie, J. Bell-Smith, and K. MacDougall.*

| 1894 | Mean Temperature | | | | | Rain | | |
|---|---|---|---|---|---|---|---|---|
| | 7·30 | 10 | 1 | 4 | Approx. Monthly Mean | Amount | Days | Greatest Fall |
| January . | 80·1 | 81·7 | 82·2 | 81·8 | 81·1 | 0·40 | 2 | 0·35 |
| February . | 80·1 | 81·4 | 81·8 | 81·5 | 80·9 | 0·05 | 1 | 0·05 |
| March . | 82·0 | 84·0 | 84·2 | 83·8 | 83·1 | 1·28 | 3 | 0·85 |
| April . | 84·0 | 85·3 | 85·8 | 84·8 | 84·9 | 0·15 | 3 | 0·20 |
| May . . | 78·2 | 81·4 | 77·7 | 80·7 | 77·9 | 14·09 | 14 | 3·25 |
| June . . | 81·2 | 82·3 | 82·1 | 81·3 | 81·2 | 5·21 | 18 | 1·30 |
| July . . | 77·9 | 78·6 | 78·8 | 78·4 | 78·3 | 1·76 | 8 | 0·44 |
| August . | 77·8 | 79·1 | 79·1 | 78·3 | 78·4 | 1·18 | 10 | 0·19 |
| September | 78·8 | 80·6 | 80·6 | 79·8 | 79·7 | 0·00 | 0 | 0·00 |
| October . | 81·0 | 82·3 | 82·1 | 81·8 | 81·5 | 0·07 | 1 | 0·07 |
| November | 81·5 | 81·1 | 82·0 | 81·5 | 81·7 | 2·50 | 1 | 2·50 |
| | | 9 A.M. | | | | | | |
| December | — | 80·5 | — | — | 80·5 | 1·96 | 6 | 0·95 |
| Year 1894 | 80·2 | 81·5 | 81·4 | 81·4 | 81·1 | 28·95 | 67 | 3·25 |
| Year 1893 | 79·0 | 80·9 | 81·3 | 80·6 | 80·1 | 50·79 | 109 | 2·85 |

Mean Temperature assumed = ½(7·30+1). Annual range only 7° F., daily range almost non-existent.

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*Magarini (Malindi Plantations), 3° 5′ S., 40° 6′ E., about 8 miles N. W. of Malindi. Observer: James Weaver.*

| 1894-95 | Temperature: Extremes | | Mean Temperature | | | Daily Range | Rain | | |
|---|---|---|---|---|---|---|---|---|---|
| | Max. | Min. | Max. | Min. | Monthly Mean | | Amount | Days | Heaviest Fall |
| 1894 | | | | | | | | | |
| March . | 93 | 70 | 91·4 | 71·2 | 81·3 | 20·2 | 3·38 | 4 | 1·78 |
| April . | 94 | 70 | 91·8 | 72·6 | 82·2 | 19·2 | 0·65 | 4 | 0·38 |
| May . | 92 | 67 | 88·1 | 70·2 | 79·1 | 17·9 | 10·31 | 15 | 2·67 |
| June . | 89 | 63 | 83·3 | 67·7 | 75·5 | 15·6 | 4·42 | 13 | 0·87 |
| July . | 91 | 63 | 86·2 | 65·7 | 75·9 | 20·5 | 1·69 | 13 | 0·45 |
| August . | 91 | 65 | 87·6 | 66·0 | 76·8 | 21·6 | 0·72 | ? | ? |
| September | 90 | 64 | 89·5 | 65·5 | 77·5 | 24·0 | 0·07 | 3 | 0·40 |
| October . | 94 | 62 | 89·3 | 67·4 | 78·3 | 21·9 | 0·00 | 0 | — |
| November | 91 | 71 | 89·3 | 71·7 | 80·5 | 17·6 | 7·56 | 11 | 3·67 |
| December | 91 | 67 | 89·2 | 71·2 | 80·2 | 18·0 | 4·48 | 6 | 2·56 |
| 1895 | | | | | | | | | |
| January . | 93 | 67 | 91·3 | 70·3 | 80·8 | 21·0 | 0·00 | 0 | 0·00 |
| February . | 93 | 68 | 91·4 | 69·8 | 80·6 | 21·6 | 0·11 | 1 | 0·11 |
| Year . | 94 | 62 | 89·0 | 69·1 | 79·1 | 19·9 | 33·39 | [75] | 3·67 |

Temperature quite untrustworthy. The daily range, to judge from observations made in 1892, does not appear to exceed 12°, whilst the mean temperature is about 73° F.

The rains only commenced on March 7, about 24 to 30 days behind the normal period, and it was then too late for sowing rice and metamah, *except on irrigated land.*

*Lamu, 2° 16′ S., 40° 54′ E. Observer: Donald MacLennan.*

| 1894 | Mean Temperature: Dry Bulb | | Mean Temperature: Wet Bulb | | Relative Humidity | | Rain | | |
|---|---|---|---|---|---|---|---|---|---|
| | 10 a.m. | 4 p.m. | 10 a.m. | 4 p.m. | 10 a.m. | 4 p.m. | Amount | Days | Heaviest Fall |
| | | | | | p.c. | p.c. | In. | | |
| January . | 85·4 | 82·9 | 75·4 | 73·9 | 60 | 66 | 0 | 0 | — |
| February . | 85·0 | 83·1 | 75·3 | 74·8 | 64 | 65 | 0 | 0 | — |
| March . | 84·2 | 81·7 | 76·0 | 74·3 | 67 | 69 | 0·15 | 1 | 0·15 |
| April . | 84·3 | 82·5 | 77·1 | 75·3 | 70 | 70 | 0·25 | 1 | 0·25 |
| May . | 81·7 | 79·1 | 76·2 | 75·3 | 77 | 83 | 15·28 | 16 | 3·00 |
| June . | 79·5 | 76·8 | 74·7 | 73·0 | 79 | 83 | 2·15 | 7 | 0·75 |
| July . | 80·2 | 79·2 | 75·5 | 73·8 | 79 | 76 | 0·45 | 3 | 0·30 |
| August . | 79·7 | 79·0 | 74·6 | 74·0 | 78 | 78 | 0·22 | 2 | 0·12 |
| September | 81·0 | 80·5 | 76·5 | 75·8 | 80 | 80 | 0 | 0 | — |
| October . | 83·1 | 81·9 | 77·7 | 77·1 | 77 | 79 | 0·10 | 1 | 0·10 |
| November | 82·7 | 82·0 | 77·4 | 76·5 | 78 | 77 | 1·60 | 2 | 1·40 |
| | 9 a.m. | | 9 a.m. | | 9 a.m. | | | | |
| December | 83·1 | — | 77·6 | — | 77 | — | 0·94 | 4 | 0·35 |
| Year . . | — | — | — | — | — | — | 21·14 | 37 | 3·00 |

The "mean temperature" here given appears to be the mean of 10 a.m. and 4 p.m., and the true mean does not consequently exceed 77°.

*Kisimayu, 0° 22′ S., 42° 33′ E. Observer: C. H. Craufurd.*

| 1894-95 | Mean Temperature | Rain | | |
|---|---|---|---|---|
| | | Amount | Days | Heaviest Fall |
| 1894 | ° | In. | | In. |
| April . | 84·0 | 3·89 | 3 | 2·10 |
| May . | 81·0 | 5·24 | 10 | 1·40 |
| June . | 79·0 | 1·17 | 2 | 0·70 |
| July . | 79·0 | 0·53 | 3 | 0·35 |
| August . | 79·0 | 0·52 | 2 | 0·45 |
| September | 79·1 | 0·00 | 0 | — |
| October . | 81·5 | 0·29 | 1 | 0·29 |
| November | 80·3 | 0·60 | 4 | 0·40 |
| December | 81·5 | 1·59 | 2 | 1·38 |
| 1895 | | | | |
| January . | 81·0 | 0·00 | 0 | — |
| February | 82·0 | 0·00 | 0 | — |
| March . | 84·0 | 0·00 | 0 | — |
| Year . | 79·5 | 13·73 | 27 | 2·10 |

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*Machako's (Ukamba). Lat. 1° 31′ S., Long. 37° 18′ E., 5400 feet. Observer: John Ainsworth.*

| 1894 | Mean Temperature | | | | | | Mean Temp. Wet Bulb | | | | Relative Humidity | | | | Rain | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 7.30 | 10 | 1 | 4 | Approx. Monthly Mean | Variableness | 7.30 | 10 | 1 | 4 | 7.30 | 10 | 1 | 4 | Amount | Days | Heaviest Fall |
| | | | | | | | | | | | p.c. | p.c. | p.c. | p.c. | | | |
| January . | 60·9 | 69·7 | 74·2 | 72·1 | 67·5 | 0·4 | 57·2 | 60·2 | 62·2 | 61·1 | 78 | 55 | 47 | 50 | 0·75 | 3 | 0·50 |
| February . | 63·0 | 72·0 | 77·4 | 74·7 | 70·2 | 1·5 | 59·4 | 62·1 | 63·9 | 61·5 | 80 | 54 | 44 | 43 | 0·16 | 2 | 0·12 |
| March . . | 63·6 | 71·6 | 73·0 | 73·8 | 68·3 | 2·0 | 60·6 | 63·3 | 64·8 | 63·2 | 83 | 61 | 62 | 52 | 5·48 | 11 | 1·76 |
| April . . | 62·8 | 68·2 | 72·9 | 71·7 | 67·3 | 1·0 | 60·2 | 62·9 | 64·2 | 62·8 | 85 | 73 | 60 | 58 | 9·33 | 12 | 1·94 |
| May . . | 61·1 | 65·7 | 69·1 | 68·3 | 65·1 | 1·3 | 58·9 | 61·1 | 62·8 | 62·3 | 87 | 75 | 69 | 70 | 1·93 | 8 | 0·53 |
| June . . | 57·6 | 61·8 | 65·2 | 64·1 | 61·4 | 1·0 | 55·5 | 57·7 | 59·5 | 58·7 | 87 | 77 | 70 | 71 | 0·58 | 3 | 0·47 |
| July . . | 56·3 | 62·5 | 68·1 | 67·2 | 62·2 | 1·5 | 54·1 | 56·6 | 58·8 | 57·9 | 86 | 67 | 54 | 54 | 0·09 | 3 | 0·05 |
| August . | 58·2 | 64·8 | 69·2 | 67·5 | 63·7 | 1·4 | 54·7 | 57·5 | 58·9 | 57·6 | 79 | 62 | 51 | 51 | 0·06 | 2 | 0·03 |
| September | 59·6 | 67·9 | 73·6 | 71·4 | 66·6 | 1·6 | 56·3 | 59·4 | 61·3 | 59·7 | 80 | 57 | 45 | 43 | 0·02 | 1 | 0·02 |
| October . | 62·6 | 71·0 | 75·8 | 73·0 | 69·2 | 1·2 | 58·9 | 61·2 | 62·4 | 60·3 | 79 | 54 | 43 | 43 | 1·27 | 6 | 0·70 |
| November | 62·2 | 67·7 | 70·7 | 68·3 | 66·4 | 1·5 | 59·8 | 62·5 | 63·8 | 62·7 | 86 | 73 | 67 | 72 | 18·16 | 22 | 3·18 |
| December | 62·4 | 67·0 | 69·9 | 69·0 | 66·1 | 2·1 | 59·0 | 61·6 | 63·4 | 62·6 | 81 | 72 | 68 | 67 | 4·13 | 11 | 1·25 |
| Year . . | 60·9 | 67·5 | 71·6 | 70·1 | 66·2 | 1·4 | 57·9 | 60·5 | 62·2 | 60·9 | 82 | 65 | 56 | 56 | 41·97 | 84 | 3·18 |

MACHAKO'S.

*Mean Temperature* assumed = ½(7.36 + 1). Annual range 8°·8, daily range perhaps 15°.

*Variableness:* mean 1°·4; mean of the extremes in each month 3°·7.

*Rain-fall.*—The rain-fall in November was quite exceptional; the natives do not remember such a heavy fall for the time of the year. In 1893 only 6·64 in. fell.

*Fort Smith (Kikuyu). Lat. 1° 14′ S., Long. 36° 44′ E., 6400 feet. Observers: F. G. Hall and J. M. Dᴈ Winton (September).*

| 1894 | Mean Temperature | | | | | | Mean Temp. Wet Bulb | | | | Relative Humidity | | | | Rain | | | Prevail. Wind |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 7.30 | 10 | 1 | 4 | Approx. Monthly Mean | Variableness | 7.30 | 10 | 1 | 4 | 7.30 | 10 | 1 | 4 | Amount | Days | Heaviest Fall | |
| | | | | | | | | | | | p.c. | p.c. | p.c. | p.c. | In. | | In. | |
| January . | 58·7 | 66·9 | 72·2 | 63·3 | 65·4 | 1·7 | 55·4 | 59·0 | 62·9 | 62·0 | 80 | 60 | 57 | 90 | 1·12 | 3 | 0·72 | N.E. |
| February . | 59·5 | 68·5 | 76·0 | 72·5 | 67·7 | 1·1 | 56·2 | 60·0 | 63·0 | 62·6 | 80 | 58 | 45 | 55 | 0·23 | 2 | 0·20 | N.E. |
| March . . | 60·3 | 69·0 | 72·3 | 68·5 | 66·3 | 1·9 | 58·2 | 61·3 | 62·6 | 60·8 | 89 | 62 | 55 | 62 | 5·33 | 12 | 2·46 | N.E. |
| April . . | 58·6 | 64·2 | 70·4 | 66·7 | 64·5 | 1·2 | 57·2 | 61·0 | 65·8 | 62·4 | 90 | 77 | 77 | 77 | 7·23 | 20 | 1·40 | N.E. |
| May . . | 57·5 | 63·5 | 67·2 | 64·7 | 62·3 | 1·9 | 57·0 | 62·0 | 65·7 | 63·8 | 97 | 91 | 92 | 95 | 8·11 | 22 | 2·07 | E. |
| June . . | 55·6 | 60·0 | 64·0 | 62·8 | 59·8 | 1·6 | 55·0 | 58·4 | 62·8 | 62·0 | 96 | 90 | 93 | 93 | 3·46 | 13 | 1·38 | N.E. |
| July . . | 53·2 | 60·2 | 65·3 | 64·3 | 59·2 | 1·5 | 52·5 | 59·2 | 63·5 | 62·9 | 97 | 94 | 88 | 91 | 2·13 | 8 | 1·08 | N.E. |
| August . | 54·2 | 59·2 | 65·9 | 62·6 | 60·1 | 1·9 | 53·4 | 58·9 | 64·1 | 61·2 | 92 | 98 | 88 | 91 | 1·02 | 9 | 0·37 | — |
| September | 54·8 | 61·1 | 70·2 | 65·5 | 63·0 | 1·5 | 54·1 | 59·9 | 68·8 | 64·4 | 95 | 99 | 93 | 94 | 2·22 | 10 | 1·08 | — |
| October . | 56·1 | 62·9 | 71·1 | 65·6 | 63·6 | 1·5 | 55·4 | 61·4 | 68·9 | 63·6 | 96 | 91 | 88 | 89 | 1·27 | 11 | 0·53 | — |
| November | 56·0 | 61·5 | 66·6 | 65·5 | 61·3 | 1·5 | 55·4 | 60·0 | 65·4 | 64·5 | 96 | 91 | 93 | 94 | 6·68 | c. 24 | 2·13 | E.N.E. |
| December | 56·3 | 62·1 | 68·7 | 63·5 | 62·5 | 1·3 | 55·0 | 59·7 | 64·1 | 60·7 | 91 | 86 | 76 | 82 | 9·32 | 16 | 1·67 | — |
| Year . . | 56·7 | 63·3 | 69·2 | 65·5 | 62·9 | 1·6 | 55·4 | 60·1 | 64·8 | 62·5 | 92 | 83 | 78 | 84 | 48·12 | 150 | 2·96 | — |

FORT SMITH.

*Mean Temperature* assumed = ½(7.30 + 1). Annual range 8°·5; daily range perhaps 15°.

*Variableness:* mean 1°·6; mean of the extremes in each month 4°·3.

*Rain-fall.*—The rain-fall in December seems to have been exceptionally heavy. In 1893 only 3·80 in. fell. On the other hand the "great rains" in March and April were very light, for only 12·56 in. fell, as compared with 29·25 in. in 1893.

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## *British East Africa. Rain-fall—Amount in Inches.*

| Station | Year | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Year |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chuyu (4° 38′ S., 39° 21′ E.). | 1893 | 4·51 | 1·53 | 6·74 | *15·30* | 10·80 | 9·24 | 2·65 | 2·01 | 0·32 | 0·68 | *10·94* | 1·55 | 66·27 |
| | 1894 | — | 2·05 | 2·12 | 2·63 | *10·81* | 5·54 | 4·19 | 2·05 | 0·16 | 0·11 | *7·42* | 4·94 | — |
| | 1895 | — | 0·25 | 2·00 | — | — | — | — | — | — | — | — | — | — |
| Mombasa (4° 4′ S., 39° 42′ E., 60 ft.). | 1875 | — | — | — | 12·20 | *14·13* | 6·30 | 9·22 | 1·89 | 0·35 | 4·60 | 0·35 | *4·68* | — |
| | 1876 | 0·35 | 0·18 | 3·57 | 5·99 | *16·40* | 3·16 | 4·68 | 2·72 | 2·68 | 1·00 | 0·56 | 0·60 | 41·89 |
| | 1890 | — | — | — | 6·94 | *16·65* | 1·59 | 2·10 | 1·36 | 0·57 | 0·15 | 2·52 | 1·32 | — |
| | 1891 | 0·62 | 0·02 | 0·62 | 3·74 | *14·81* | 5·63 | 1·68 | 2·03 | 2·46 | *8·83* | 3·53 | 2·56 | 46·56 |
| | 1892 | 0·11 | 0·43 | 0·41 | 6·18 | *11·32* | 1·43 | 2·17 | 1·26 | 1·52 | 0·35 | 1·26 | 0·39 | 26·83 |
| | 1893 | 2·43 | 1·85 | 4·68 | 12·51 | *14·29* | 7·69 | 2·15 | 2·78 | 2·10 | 2·27 | *10·91* | 0·51 | 64·17 |
| | 1894 | 0·16 | 2·51 | 1·46 | 3·04 | *12·29* | 4·27 | 1·49 | 1·33 | 0·29 | 0·65 | *7·59* | 2·88 | 37·96 |
| | 1895 | 0·01 | 0·34 | 3·03 | — | — | — | — | — | — | — | — | — | — |
| | Mean[1] | 1·22 | 0·94 | 2·16 | 7·67 | *13·47* | 4·63 | 3·72 | 2·78 | 2·55 | 3·50 | *6·51* | 1·73 | 49·88 |
| Takaungu (3° 41′ S., 39° 52′ E.). Observers in 1894: J. Bell-Smith and K. MacDougall. | 1892 | 0·82 | 0·26 | — | 1·14 | *14·01* | 5·21 | 1·53 | 1·21 | 2·70 | 0·00 | *2·71* | 0·00 | — |
| | 1893 | 1·50 | 0·57 | 5·41 | 7·01 | *9·39* | 7·87 | 2·80 | 1·67 | 0·55 | 1·39 | *1·86* | 0·64 | 40·66 |
| | 1894 | 0·00 | 0·00 | 1·91 | 4·57 | *15·39* | 5·46 | 1·85 | 0·49 | 0·37 | 0·17 | *7·20* | 0·60 | 38·01 |
| | 1895 | 0·00 | 0·08 | 5·11 | — | — | — | — | — | — | — | — | — | — |
| | Mean | 0·58 | 0·23 | 4·14 | 4·24 | 12·93 | 6·18 | 2·06 | 1·12 | 1·21 | 0·52 | 3·92 | 0·41 | 37·54 |
| Malindi (3° 13′ S., 40° 7′ E.). | 1891 | — | — | — | 5·85 | *12·00* | 4·26 | 3·68 | 2·08 | 1·80 | 3·31 | 3·48 | *4·02* | — |
| | 1892 | 0·61 | 0·50 | 0·49 | 5·97 | *14·90* | 3·94 | 1·82 | 0·29 | 1·41 | 0·35 | 0·15 | 0·19 | 30·12 |
| | 1893 | 0·75 | 0·12 | 2·38 | *18·50* | 7·83 | 7·65 | 2·26 | 1·71 | 1·05 | 1·14 | *5·77* | 1·63 | 50·79 |
| | 1894 | 0·40 | 0·05 | 1·28 | 0·45 | *14·09* | 5·21 | 1·76 | 1·18 | 0·00 | 0·07 | *2·50* | 1·96 | 28·95 |
| | 1895 | 0·03 | 0·10 | 0·85 | — | — | — | — | — | — | — | — | — | — |
| | Mean | 0·45 | 0·19 | 1·25 | 7·69 | *12·08* | 5·26 | 2·38 | 1·31 | 1·07 | 1·22 | *2·97* | 1·95 | 37·82 |
| Jilore (3° 10′ S., 39° 55′ E.). | 1893 | 3·75 | 2·24 | 2·96 | *6·77* | 4·92 | 3·62 | 1·14 | 2·04 | 0·69 | 0·59 | *4·71* | — | — |
| | 1894 | — | — | 1·87 | — | — | — | — | — | — | — | *4·49* | 3·69 | — |
| | 1895 | 0·10 | — | 2·58 | — | — | — | — | — | — | — | — | — | — |
| Magarini (3° 5′ S., 40° 6′ E.). | 1893 | 0·85 | 0·37 | 2·69 | *13·45* | 5·25 | 5·61 | 2·65 | 1·97 | 0·72 | 0·84 | *4·80* | 1·00 | 40·20 |
| | 1894 | 0·00 | 0·00 | 3·38 | 0·65 | *10·31* | 4·42 | 1·69 | 0·72 | 0·07 | 0·00 | *7·56* | 4·48 | 33·28 |
| | 1895 | 0·00 | 0·11 | 3·97 | — | — | — | — | — | — | — | — | — | — |
| Lamu (2° 16′ S., 40° 54′ E.). | 1890 | 0·21 | 0·00 | 1·50 | 1·95 | *18·06* | 2·50 | 2·17 | 1·22 | 1·20 | 0·13 | 0·04 | 0·00 | 28·98 |
| | 1893 | 0·41 | 1·04 | 2·97 | 15·50 | *16·35* | 2·93 | 0·85 | 0·56 | 0·97 | *1·70* | 0·35 | 0·91 | 44·54 |
| | 1894 | 0·00 | 0·00 | 0·15 | 0·25 | *15·28* | 2·15 | 0·45 | 0·22 | 0·00 | 0·10 | *1·60* | 0·94 | 21·14 |
| | Mean | 0·20 | 0·35 | 1·54 | 5·90 | 16·56 | 2·53 | 1·16 | 0·66 | 0·72 | 0·64 | 0·66 | 0·62 | 31·55 |
| Kisimayu (0° 22′ S., 42° 33′ E.), | 1893 | — | — | — | 4·49 | *5·63* | 0·16 | 0·00 | — | — | — | — | — | — |
| | 1894 | — | — | — | 3·89 | *5·24* | 1·17 | 0·53 | 0·52 | 0·00 | 0·29 | 0·60 | *1·59* | 13·73 |
| | 1895 | 0·00 | 0·00 | 0·00 | — | — | — | — | — | — | — | — | — | — |
| Mbungu (3° 46′ S., 39° 30′ E.). Observer: Rev. J. Hofmann. | 1891 | — | — | — | — | 6·03 | 2·25 | 0·85 | 1·12 | 1·21 | 0·70 | *3·72* | 3·54 | — |
| | 1892 | 1·52 | 1·49 | 2·37 | 1·76 | 2·69 | 1·53 | — | — | — | — | — | 1·56 | — |
| | 1893 | 4·47 | 1·13 | *8·65* | 5·84 | 3·78 | — | 0·49 | 2·13 | 0·51 | 1·56 | *5·07* | — | — |
| | 1894 | — | — | — | — | 7·30 | 0·64 | 1·70 | 0·75 | 0·03 | 0·04 | 5·64 | 2·08 | — |
| | 1895 | 0·00 | 1·09 | 4·17 | — | — | — | — | — | — | — | — | — | — |
| Ndi (3° 20′ S., 38° 29′ E., 2400 ft.). Observer: Ch. Wise. | 1894 | — | — | — | — | — | — | — | — | — | — | 2·40 | 5·69 | — |
| | 1895 | 1·10 | 2·22 | 5·01 | — | — | — | — | — | — | — | — | — | — |
| Kibwezi (2° 25′ S., 37° 55′ E., 3000 ft.): Observer: Rev. T. Watson. | 1893 | — | — | — | — | — | — | — | — | — | — | *15·72* | 7·80 | — |
| | 1894 | 0·12 | 0·58 | *6·64* | 1·44 | 1·13 | 0·05 | 0·00 | 0·00 | 0·00 | 0·00 | *13·55* | 3·24 | 26·73 |
| Machako's (1° 31′ S., 37° 18′ E., 5400 ft.). | 1893 | — | — | — | — | — | — | — | — | 0·00 | 1·37 | 6·64 | 6·34 | — |
| | 1894 | 0·75 | 0·16 | 5·48 | *9·31* | 1·93 | 0·58 | 0·09 | 0·06 | 0·02 | 1·27 | *18·16* | 4·13 | 41·06 |
| | 1895 | 0·00 | 3·85 | 10·13 | — | — | — | — | — | — | — | — | — | — |
| Fort Smith, Kikuyu (1° 14′ S., 36° 44′ E., 6400 ft.). | 1893 | — | — | 13·65 | *15·60* | 8·54 | 0·28 | 1·01 | — | 2·63 | 0·61 | *6·09* | 3·80 | — |
| | 1894 | 1·12 | 0·23 | 5·33 | 7·23 | *8·11* | 3·46 | 2·13 | 1·02 | 2·22 | 1·27 | 6·68 | *9·32* | 48·12 |
| | 1895 | 0·00 | 7·43 | 10·46 | — | — | — | — | — | — | — | — | — | — |

[1] The means for Mombasa are deduced from nearly eleven years' observations, including those made at Frere Town, where 90·06 in. fell in 1877, 51·30 in. in 1875, 45·57 in. in 1879, and 44·75 in. in 1880.

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## *Heaviest Fall of Rain within 24 Hours.*

| Station | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sep. | Oct. | Nov. | Dec. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chuyu . | — | 1·61 | 0·93 | 1·50 | *3·68* | 1·43 | 1·30 | 1·17 | 0·16 | 0·09 | 1·43 | 1·62 |
| Mombasa . | 0·12 | 2·14 | 0·46 | 1·63 | *3·62* | 1·63 | 0·50 | 0·40 | 0·70 | 0·27 | 1·18 | 1·53 |
| Takaungu. | — | — | 1·41 | 1·87 | *4·55* | 1·70 | 0·75 | 0·15 | 0·19 | 0·17 | 0·38 | 0·33 |
| Malindi . | 0·35 | 0·05 | 0·85 | 0·20 | *3·26* | 1·30 | 0·44 | 0·19 | — | 0·07 | 2·50 | 0·95 |
| Jilore . | — | — | 1·12 | — | — | — | — | — | — | — | 1·20 | 2·16 |
| Magarini . | — | — | 1·78 | 0·38 | 2·67 | 0·87 | 0·45 | — | 0·40 | — | *3·67* | 2·56 |
| Lamu . | 0·00 | 0·00 | 0·15 | 0·25 | *3·00* | 0·75 | 0·30 | 0·12 | — | 0·10 | 1·40 | 0·35 |
| Kisimayu . | — | — | — | 2·10 | *1·40* | 0·70 | 0·35 | 0·45 | 0·00 | 0·29 | 0·40 | 1·38 |
| Mbungu . | — | — | — | — | *1·68* | 0·22 | 0·76 | 0·19 | 0·03 | 0·04 | 1·57 | 0·92 |
| Kibwezi . | 0·12 | 0·33 | 2·90 | 1·04 | 0·67 | 0·05 | — | — | — | — | *3·34* | 1·18 |
| Machako's | 0·50 | 0·12 | 1·76 | 1·94 | 0·53 | 0·47 | 0·05 | 0·03 | 0·02 | 0·70 | *3·18* | 1·25 |
| Fort Smith | 0·72 | 0·20 | *2·96* | 1·40 | 2·07 | 1·38 | 1·08 | 0·37 | 1·08 | 0·53 | 2·13 | 1·67 |

## *Number of Rainy Days.*

Only days on which at least 0·01 in. of Rain fell are counted.

| Station | Year | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sep. | Oct. | Nov. | Dec. | Year |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chuyu . . | 1893 | 5 | 2 | 5 | 10 | 19 | 20 | 16 | 12 | 4 | 2 | 17 | 4 | 116 |
| ,, . . | 1894 | — | 3 | 7 | 6 | 17 | 19 | 11 | 3 | 1 | 2 | 15 | 7 | — |
| ,, . . | 1895 | — | 1 | 9 | — | — | — | — | — | — | — | — | — | — |
| Mombasa . | 1893 | 7 | 8 | 10 | 19 | 24 | 16 | 14 | 22 | 13 | 10 | 15 | 6 | 164 |
| ,, . | 1894 | 2 | 3 | 6 | 8 | 18 | 11 | 7 | 9 | 8 | 9 | 19 | 2 | 102 |
| ,, . | 1895 | 1 | 3 | 7 | — | — | — | — | — | — | — | — | — | — |
| Takaungu . | 1893 | 3 | 1 | 7 | 12 | 21 | 18 | 11 | 11 | 4 | 3 | 10 | 1 | 102 |
| ,, . | 1894 | — | — | 3 | 4 | 14 | 14 | 8 | 4 | 3 | 1 | 9 | 3 | — |
| ,, . | 1895 | 0 | 2 | 8 | — | — | — | — | — | — | — | — | — | — |
| Malindi . | 1893 | 3 | 1 | 5 | 22 | 18 | 14 | 12 | 9 | 5 | 6 | 10 | 4 | 99 |
| ,, . | 1894 | 2 | 1 | 3 | 3 | 14 | 18 | 8 | 10 | — | 1 | 1 | 6 | — |
| ,, . | 1895 | 3 | 1 | 2 | — | — | — | — | — | — | — | — | — | — |
| Jilore . . | 1893 | 4 | 6 | 8 | 6 | 13 | 15 | 9 | 14 | 6 | 3 | 10 | [3] | [97] |
| ,, . . | 1894 | — | — | 4 | — | — | — | — | — | — | — | 7 | 5 | — |
| ,, . . | 1895 | 6 | — | 7 | — | — | — | — | — | — | — | — | — | — |
| Magarini . | 1893 | 5 | 1 | 4 | 21 | 22 | 24 | 18 | 17 | 9 | 2 | 21 | 6 | 150 |
| ,, . | 1894 | — | — | 4 | 4 | 15 | 13 | 13 | — | 3 | 0 | 11 | 6 | — |
| ,, . | 1895 | 0 | 1 | 9 | — | — | — | — | — | — | — | — | — | — |
| Lamu . . | 1893 | 3 | 1 | 8 | 22 | 24 | 9 | 4 | 4 | 4 | 3 | 2 | 2 | 86 |
| ,, . . | 1894 | 0 | 0 | 1 | 1 | 16 | 7 | 3 | 2 | 0 | 1 | 2 | 4 | 37 |
| Kisimayu | 1893 | — | — | — | 12 | 11 | 2 | 0 | — | — | — | — | — | — |
| ,, . | 1894 | — | — | — | 3 | 10 | 2 | 3 | 2 | 0 | 1 | 4 | 2 | } 27 |
| ,, . | 1895 | 0 | 0 | 0 | — | — | — | — | — | — | — | — | — | |
| Mbungu . | 1893 | 9 | 3 | 12 | 9 | 10 | — | 4 | 11 | 3 | 5 | 15 | — | — |
| ,, . | 1894 | — | — | — | — | 14 | 11 | 5 | 10 | 1 | 1 | 14 | 8 | — |
| Ndi . . | 1894 | — | — | — | — | — | — | — | — | — | — | 5 | 11 | — |
| ,, . . | 1895 | 2 | 2 | 10 | — | — | — | — | — | — | — | — | — | — |
| Kibwezi . | 1894 | 1 | 2 | 6 | 4 | 3 | 1 | 0 | 0 | 0 | 0 | 17 | 10 | 44 |
| Machako's . | 1893 | – | – | – | — | — | — | 1 | 1 | 0 | 6 | 21 | 25 | — |
| ,, . | 1894 | 3 | 2 | 11 | 12 | 8 | 3 | 3 | 2 | 1 | 6 | 22 | 11 | 84 |
| Fort Smith . | 1893 | — | — | 16 | 25 | 16 | 2 | 3 | — | 4 | 8 | 18 | 19 | — |
| ,, . | 1894 | 3 | 2 | 12 | 20 | 22 | 13 | 8 | 9 | 10 | 11 | [24] | 16 | 150 |

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*The Climatology of Africa.—Fifth Report of a Committee, consisting of* Mr. E. G. RAVENSTEIN (*Chairman*), SIR JOHN KIRK, Mr. G. J. SYMONS, Dr. H. R. MILL, *and* Mr. H. N. DICKSON (*Secretary*). (*Drawn up by the Chairman.*)

[*Extracts.*]

*British East Africa.*—Observations have been received from thirteen stations. Unfortunately, owing to the disturbed state of the country and to administrative changes, some of the registers are imperfect. The Foreign Office has met with the wishes of your Committee in the most gratifying manner. Instructions have been given by Mr. Hardinge, her Majesty's Commissioner, to have meteorological returns kept, and these will be sent to us for publication.

Three sets of instruments (including barometers and anemometers) have been forwarded by the Foreign Office to Uganda, and since the beginning of this year observations on the water-level of the Victoria Nyanza are being made by means of gauges erected at Port Alice and Port Victoria.

*Machako's* (*Ukamba*). *Lat.* 1° 31′ *S.*, *Long.* 37° 18′ *E.*, 5400 *feet*. *Observers*, *R. W. Lane, T. T. Gilkison, and John Ainsworth.*

| 1895 | Temperature 9 a.m. | | Humidity | | Rain | | | |
|---|---|---|---|---|---|---|---|---|
| | Dry | Wet | Vapour Pressure | Relative Humidity | Amount Total | Amount 6 p.m. to 6 a.m. | Days | Heaviest Fall |
| | | | In. | p.c. | In. | In. | | In. |
| January . . | 68·1 | 58·7 | ·409 | 60 | — | — | — | — |
| February . . | 67·3 | 62·4 | ·519 | 78 | 3·85 | 3·19 | 11 | 1·52 |
| March . . | 66·3 | 62·9 | ·542 | 84 | 10·13 | 7·86 | 19 | 1·95 |
| April . . | 66·5 | 63·0 | ·543 | 83 | 12·38 | 10·68 | 23 | 2·59 |
| May . . | 65·7 | 62·7 | ·541 | 86 | 2·10 | ·72 | 7 | ·89 |
| June . . | 61·5 | 58·8 | ·470 | 86 | ·77 | ·75 | 4 | ·34 |

The rains generally end in May, and the amount recorded for April is exceptionally heavy. No entries were made for January; perhaps no rain fell. (January, 1894, 0·75 in. on three days.)

*Prevailing Winds.*—May, S.E.; June 1–7, S.W.; June, 7–30, S.

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*Mombasa. Lat. 4° 4′ S., Long. 39° 42′ E., 60 feet. Observer, J. R. W. Pigott.*

| 1895 | Pressure of Atmosphere 9 a.m. | Temperatures: Extremes | | Mean Temperatures | | | | | Daily Range | Humidity | | Rain | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Highest | Lowest | Dry 9 a.m. | Wet 9 a.m. | Mean Max. | Mean Min. | Mean. | | Vapour Pressure | Relative Humidity | Amount | Days | Heaviest Fall |
| | In. | ° | ° | ° | ° | ° | ° | ° | ° | In. | p.c. | In. | | In. |
| January . | 29·818 | 85·0 | 75·4 | 80·0 | 76·7 | 82·4 | 76·7 | 80·0 | 5·7 | ·881 | 86 | ·01 | 1 | ·01 |
| February . | ·824 | 85·2 | 75·5 | 81·6 | 76·6 | 83·7 | 77·8 | 80·8 | 5·9 | ·859 | 79 | ·34 | 3 | ·27 |
| March . | ·787 | 89·1 | 78·0 | 83·7 | 78·0 | 86·4 | 79·6 | 83·0 | 6·8 | ·895 | 78 | 3·05 | 7 | 1·35 |
| April . . | ·820 | 88·0 | 76·8 | 82·0 | 77·5 | 86·1 | 78·8 | 82·4 | 7·3 | ·892 | 82 | 3·47 | 11 | ·91 |
| May . . | ·898 | 85·6 | 74·0 | 78·8 | 74·9 | 83·2 | 76·3 | 79·7 | 7·9 | ·831 | 85 | 9·99 | 19 | 2·22 |
| June . . | ·985 | 84·2 | 73·0 | 77·5 | 72·9 | 82·1 | 74·9 | 78·5 | 7·2 | ·756 | 80 | 1·44 | 4 | ·70 |
| July . . | ·991 | 83·0 | 71·0 | 76·8 | 72·0 | 80·7 | 73·7 | 77·2 | 7·0 | ·730 | 79 | 1·33 | 9 | ·42 |
| August . | ·954 | 83·0 | 72·5 | 77·5 | 71·9 | 81·3 | 74·1 | 77·7 | 7·2 | ·719 | 78 | ·68 | 3 | ·47 |
| September | ·972 | 83·5 | 71·2 | 78·2 | 73·1 | 81·6 | 74·8 | 78·7 | 6·8 | ·757 | 79 | 6·21 | 9 | 1·86 |
| October . | ·899 | 83·2 | 74·0 | 79·9 | 74·6 | 82·3 | 76·3 | 79·3 | 6·0 | ·797 | 78 | 3·04 | 3 | 2·06 |
| November | ·875 | 85·0 | 74·0 | 81·1 | 75·8 | 83·6 | 77·1 | 80·3 | 6·5 | ·832 | 78 | 3·37 | 10 | 1·03 |
| December | ·816 | 86·2 | 75·1 | 81·4 | 76·1 | 84·1 | 77·0 | 80·5 | 7·1 | ·841 | 79 | 1·42 | 6 | ·36 |
| Year . . | 29·888 | 89·1 | 71·2 | 79·9 | 75·0 | 83·1 | 76·4 | 79·8 | 6·6 | ·816 | 80 | 34·35 | 85 | 2·22 |

The barometrical observations have been reduced to 32° and corrected for gravity, but have not been reduced to sea-level.
The mean temperature is assumed to be the mean of all max. and min., and is therefore too high.

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*Fort Smith* (*Kikuyu*). *Lat.* 1° 14′ *S.*, *Long.* 36° 44′ *E.*, 6400 *feet*. *Observers: F. G. Hall* (*January to February*); *E. Russell* (*March to May*); *T. T. Gilkison* (*June to October*).

| 1894-5 | Temperature Extremes | | Mean Temperatures | | | | | Variableness | | Humidity | | Rain | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Highest | Lowest | Dry 9 a.m. | Wet 9 a.m. | Mean Max. | Mean Min. | Mean | Mean Range | Extreme | Vapour Pressure | Relative Humidity | Amount | Days | Heaviest Fall |
| | ° | ° | ° | ° | ° | ° | ° | ° | ° | In. | p. c. | In. | | In. |
| November 1894 | — | — | (59·0) | — | — | — | 61·3 | 1·27 | 4·5 | — | — | 6·68 | c.24 | 2·13 |
| December | — | — | (60·0) | — | — | — | 62·5 | 1·34 | 3·5 | — | — | 9·32 | 16 | 1·67 |
| January 1895 | 78 | 50 | 67·4 | 58·5 | 74·3 | 53·5 | 63·9 | 1·79 | 5·0 | ·408 | 61 | ·00 | 0 | — |
| February | 75 | 51 | 63·5 | 60·8 | 71·6 | 55·1 | 63·4 | 1·32 | 4·0 | ·506 | 86 | 7·43 | 13 | 2·13 |
| March | 74 | 52 | 62·8 | 60·1 | 79·9 | 55·1 | 67·5 | 1·17 | 2·5 | ·494 | 87 | 10·46 | 16 | 2·15 |
| April | 76 | 54 | 63·6 | 62·1 | 73·6 | 56·6 | 65·1 | 1·33 | 4·0 | ·543 | 93 | 16·33 | 22 | 2·75 |
| May | 74 | 52 | 63·7 | 61·8 | 73·1 | 56·8 | 64·9 | 1·24 | 4·5 | ·534 | 91 | 6·78 | 16 | 1·56 |
| June | 74 | 52 | 59·8 | 58·4 | 69·3 | 55·1 | 62·2 | 1·35 | 2·0 | ·475 | 92 | 3·68 | 9 | ·91 |
| July | 76 | 47 | 59·4 | 57·1 | 71·5 | 52·0 | 61·8 | 1·27 | 4·0 | ·445 | 88 | ·00 | 0 | — |
| August | 75 | 49 | 58·5 | 56·9 | 69·8 | 52·4 | 61·1 | 1·30 | 4·0 | ·448 | 91 | ·65 | 6 | ·35 |
| September | 78 | 50 | 62·6 | 58·5 | 73·5 | 53·1 | 63·3 | 1·86 | 3·5 | ·452 | 80 | 2·43 | 10 | ·49 |
| October | 82 | 50 | 65·0 | 59·7 | 77·8 | 53·8 | 65·8 | 1·50 | 6·0 | ·463 | 75 | 1·73 | 8 | ·64 |
| Year | 82 | 50 | 62·1 | — | — | — | 63·6 | 1·40 | 5·0 | — | 84 | 65·49 | 140 | 2·75 |

The following instruments were in use during 1896: Dry-bulb thermometer, B.T. 4634, wet bulb, B.T. 4635; max. thermometer, M.O.: 1354; min. thermometer, M.O. 1460.

*The Mean Temperature* assumed, ½ (max. + min.), is too high. Annual range, 5°·02; daily range, 19°·3.

*Variableness* (difference mean temperature from day to day): Mean 1°·40; extreme 5°.

*Rain.*—Only ten thunderstorms are noted: 2 in February, 1 in March, 6 in April, 1 in May. On February 11 a heavy hailstorm, when 0·71 inch fell in less than half-an-hour.

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*Shimoni. Lat.* 4° 38′ *S., Long.* 39° 21′ *E.*

*Observers: D. Macquarie (January to May) and D. Wilson (July to December).*

| 1895 | Pressure of Atmosphere, 9 a.m. | Mean Temperature | | Humidity | | Rain | | | Prevailing Winds |
|---|---|---|---|---|---|---|---|---|---|
| | | Dry Bulb, 9 a.m. | Wet Bulb, 9 a.m. | Vapour Pressure | Relative Humidity | Amount | Days | Heaviest Fall | |
| | In. | ° | ° | In. | p.c. | In. | | In. | |
| January | 29·854 | 82·2 | 77·9 | ·907 | 83 | — | — | — | S.E., S.W. |
| February (18 days) | ·859 | 82·2 | 81·3 | 1·021 | 93 | ·25 | 1 | — | S.E. |
| March (18 days) | ·837 | 82·4 | 81·1 | 1·008 | 91 | 2·00 | 9 | ·47 | E. |
| April | ·818 | 81·0 | 76·6 | ·866 | 82 | 6·35 | 17 | 1·11 | S.W. |
| May | ·815 | 78·7 | 75·4 | ·840 | 86 | 8·92 | 22 | 1·26 | W.S.W. |
| June | — | — | — | — | — | (7·39) | (19) | — | W.S.W. |
| July (1–15) | ·824 | 76·4 | 73·7 | ·800 | 88 | 1·55 | 5 | 1·09 | W.S.W. |
| August | ·821 | 76·6 | 73·6 | ·794 | 87 | 1·22 | 10 | 45 | W.S.W. |
| September | ·815 | 77·6 | 75·2 | ·846 | 89 | 5·62 | 12 | 1·43 | S.E. |
| October | ·804 | 79·7 | 77·2 | ·905 | 89 | ·69 | 5 | ·51 | S.W., S.E. |
| November | ·790 | 82·1 | 79·0 | ·955 | 87 | 3·32 | 9 | 1·62 | S.E., W. |
| December | ·787 | 84·5 | 80·3 | ·986 | 84 | 1·16 | 3 | ·57 | S.E., N.E. |
| Year | (29·820) | 79·9 | — | — | — | (38·47) | (112) | 1·62 | W.S.W., S.E. |

Barometer readings reduced to 32° and corrected for gravity.

Winds.—S.W. winds set in on April 1; on April 27 the wind veered round to W.S.W., and blew steadily from that direction to the end of August.

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*Malindi. Lat.* 3° 13′ *S., Long.* 40° 7′ *E.*

*Observer: K. MacDougall.*

| 1895 | Temperature 9 a.m. | | Humidity | | Rain | | |
|---|---|---|---|---|---|---|---|
| | Dry | Wet | Vapour Pressure | Relative Humidity | Amount | Days | Heaviest Fall |
| | ° | ° | In. | p.c. | In. | | In. |
| January . . | 79·1 | 76·6 | ·887 | 89 | ·08 | 3 | ·06 |
| February . | 81·6 | 78·5 | ·939 | 87 | ·10 | 1 | ·10 |
| March . . | 85·1 | 81·4 | 1·029 | 85 | ·85 | 2 | ·75 |
| April . . | 83·9 | 82·3 | 1·083 | 94 | 2·54 | 7 | ·60 |
| May . . | 80·5 | 78·3 | ·942 | 91 | 13·85 | 10 | 4·59 |
| June . . | 78·5 | 74·6 | ·812 | 83 | ·03 | 1 | ·03 |
| July . . | 78·0 | 75·0 | ·833 | 87 | 3·89 | 10 | 1·50 |
| August . . | 81·8 | 74·9 | ·787 | 72 | ·44 | 3 | ·30 |
| September . | 82·4 | 75·9 | ·810 | 73 | ·57 | 4 | ·27 |
| October . . | 82·6 | 76·2 | ·832 | 75 | 7·96 | 7 | 2·19 |
| November . | 82·7 | 79·9 | ·988 | 89 | 3·29 | 7 | 1·20 |
| December . | 81·3 | 79·0 | ·964 | 91 | 1·34 | 5 | ·65 |
| Year | 81·5 | 77·7 | ·909 | 85 | 34·94 | 60 | 4·59 |

*Ndi Station. Lat.* 3° 20′ *S., Long.* 38° 29′ *E.*, 2400 *feet.*

*Observer: Ch. Wise.*

| 1895 | Mean Temperature, 9 a.m. | Rain | | |
|---|---|---|---|---|
| | | Amount | Days | Heaviest Fall |
| | ° | In. | | In. |
| January . . . . . | 73·7 | 1·10 | 2 | ·70 |
| February . . . . . | 76·0 | 2·22 | 2 | 1·12 |
| March . . . . . | 81·0 | 5·01 | 10 | 1·00 |
| April . . . . . | 78·5 | 1·49 | 7 | ·42 |
| May . . . . . | 76·6 | ·35 | 6 | ·15 |
| June . . . . . | 73·9 | ·07 | 1 | ·07 |
| July. . . . . | 72·8 | ·03 | 1 | ·03 |
| August (1–20) . . . . | 70·8 | ·02 | 1 | ·02 |
| November . . . . | 74·5 | 5·62 | 13 | ·81 |
| December . . . . | 73·5 | 4·89 | 14 | 1·14 |

A second return for March, from the same station, gives the following results:—Mean temperature, 83°·5; rain, 1·07 inch on four days: heaviest fall within 24 hours, 0·61 inch.

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*Lamu*, 2° 16′ *S.*, 40° 54′ *E.* *Observer: Donald MacLennan.*

| 1895 | Mean Temp. 9 a.m. | | Humidity | | Rain | | |
|---|---|---|---|---|---|---|---|
| | Dry | Wet | Vapour Pressure | Relative Humidity | Amount | Days | Heaviest Fall |
| | ° | ° | Inch | p.c. | Inch | | Inch |
| January . | 84·0 | 77·4 | ·866 | 74 | ·00 | 0 | — |
| April . . | 84·7 | 78·7 | ·913 | 77 | 3·93 | 5 | 1·55 |
| May . . | 81·3 | 78·9 | ·960 | 90 | 13·46 | 16 | 2·65 |
| June . . | 79·3 | 76·4 | ·876 | 88 | 1·97 | 8 | ·51 |

*Kisimayu*, 0° 22′ *S.*, 42° 33′ *E.* *Observer: C. H. Craufurd.*

| 1825 | Mean Temperature 9 a.m. | Rain | | |
|---|---|---|---|---|
| | | Amount | Days | Heaviest Fall |
| | ° | Inch | | Inch |
| January . | 81·0 | ·00 | 0 | — |
| February . | 82·1 | ·00 | 0 | — |
| March . . | 84·6 | ·00 | 0 | — |
| April . . | 84·7 | ·62 | 6 | ·36 |
| May . . | 82·1 | 4·88 | 11 | 3·33 |
| June . . | — | — | — | — |
| July . . | 77·7 | 1·55 | 8 | ·96 |
| August . | 78·7 | ·63 | 6 | ·34 |
| September | 79·6 | ·03 | 2 | ·02 |
| October . | 81·0 | ·00 | 0 | — |

*Rain-fall in British East Africa*, 1895.

| Stations | | Jan. | Feb. | March | April | May | June | July | August | Sept. | Oct. | Nov. | Dec. | Year |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Takaungu (3° 41′ S., 39° 52′ E.). Observer: K. Mac Dougall. | Inch | ·00 | ·08 | 5·11 | 4·56 | 12·52 | 1·01 | ·98 | ·95 | 5·17 | 1·08 | 3·91 | ·34 | 35·71 |
| | Days | 0 | 2 | 8 | 7 | 15 | 3 | 1 | 7 | 9 | 5 | 9 | 2 | 68 |
| | Heaviest Fall | — | ·05 | 3·30 | 1·37 | 2·67 | ·43 | ·98 | ·45 | ·94 | ·40 | 1·53 | ·27 | 3·30 |
| Kulesa, Tana River (2° 10′ S., 40° 18′ E.). | Inch | — | 1·35 | 1·74 | 2·79 | 1·91 | ·10 | 2·10 | 1·00 | — | — | — | — | — |
| | Days | — | 4 | 7 | 5 | 3 | 1 | 6 | 4 | — | — | — | — | — |
| | Heaviest Fall | — | ·50 | ·95 | 1·63 | 1·40 | ·10 | 1·20 | ·69 | — | — | — | — | — |
| Kibwezi (2° 25′ S., 37° 55′ E., 3000 ft.). Observer: Rev. T. Watson, E.A. S.M. | Inch | ·06 | 1·72 | 5·80 | 6·99 | ·32 | ·00 | ·00 | ·01 | ·17 | ·14 | 11·76 | 6·14 | 33·11 |
| | Days | 2 | (11) | (18) | 13 | 6 | 0 | 0 | 1 | 3 | 3 | 16 | 17 | 90 |
| | Heaviest Fall | ·04 | ·95 | ·99 | 2·12 | ·16 | ·00 | ·00 | ·01 | ·14 | ·09 | 2·68 | 1·76 | 2·68 |
| Mbungu (3° 46′ S., 39° 30′ E.). Observer: Rev. J. Hofmann. | Inch | ·00 | 1·09 | 4·17 | 4·03 | 3·31 | — | — | — | — | — | — | — | — |
| | Days | 0 | 2 | (10) | 7 | 11 | — | — | — | — | — | — | — | — |
| | Heaviest Fall | — | ·90 | 1·02 | 3·20 | 1·41 | — | — | — | — | — | — | — | — |

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*Magarini* (*Malindi Shambas*). *Lat.* 3° 13′ *S.*, *Long.* 40° 7′ *E.*, 8 *miles N.W. of Malindi. Observer: James Weaver.*

| 1895 | Temperature Extremes | | Mean Temperature | | | Rain | | |
|---|---|---|---|---|---|---|---|---|
| | Highest | Lowest | Max. | Min. | Mean | Amount | Days | Heaviest Fall |
| | ° | ° | ° | ° | ° | Inch | | Inch |
| January . . | 93 | 67 | 91·3 | 70·3 | 80·8 | 00 | 0 | ·00 |
| February . . | 93 | 68 | 91·4 | 69·8 | 80·6 | ·11 | 1 | ·11 |
| March . . | 96 | 68 | 92·8 | 69·8 | 81·3 | 3·97 | 9 | 2·01 |
| May[1] . . | — | — | — | — | — | 7·76 | 18 | 2·21 |

[1] Violent earth tremors were experienced between May 15 and 23.

*The Climatology of Africa.—Sixth Report of a Committee, consisting of* Mr. E. G. RAVENSTEIN (*Chairman*), SIR JOHN KIRK, Mr. G. J. SYMONS, Dr. H. R. MILL, *and* Mr. H. N. DICKSON (*Secretary*). (*Drawn up by the Chairman.*)

[*Extracts.*]

*British East Africa.*—The usual reports have only been received up to June last, and we therefore defer their publication until the reports for a full year shall have come to hand.

The Scottish missionaries at Kibwezi, to whom your Committee granted a set of instruments last year, have regularly sent in their registers since July last. They have been kept with much care, and include hourly observations for sixteen term-days, the first of the kind received from this Protectorate.

A return of one year's rain-fall at Mumia's in Kavirondo has been received from Mr. C. W. Hobley, who also forwards a few observations made with a Symons's earth-thermometer.

*Uganda.*—Through the kindness of the Foreign Office, we hope to be enabled to publish in our next report full meteorological records for a number of stations. In the meantime we present abstracts of fourteen months' observations on the variations in the level of the Victoria Nyanza, which have been made at three stations since January 1896.

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*Rain-fall in British East Africa.*

| 1896 | Mombasa | | Shimoni | | Malindi | | Lamu | | Takaungu | | Ndi | | Machako's | | Kisimayu | | Kikuyu | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Inches | Days | Inches | Days | Inches | Days | Inches | Days | Inches | Days | Inches | Days | Inches | Days | Inches | Days | Inches | Days |
| January . . | ·41 | 2 | ·22 | 2 | ·01 | 1 | ·00 | — | 2 | 3 | ·10 | 2 | ·16 | 1 | ·00 | 0 | 1·28 | 2 |
| February . . | ·00 | — | ? | ? | ·00 | — | ·15 | 1 | ·00 | — | ·63 | 3 | ·36 | 2 | ·00 | — | ·35 | 2 |
| March . . . | 2·80 | 8 | ? | ? | ·21 | 2 | 2·10 | 3 | ·47 | 4 | ? | ? | 1·80 | 5 | ·00 | — | 1·74 | 7 |
| April [1] . . | 2·08 | 12 | 2·07 | 6 | 4·37 | 12 | 3·33 | 8 | 2·46 | 3 | 2·61 | 6 | 3·66 | 9 | ·07 | 1 | 3·89 | 14 |
| May . . . | 10·93 | 11 | 12·64 | 23 | 8·44 | 12 | 7·06 | 17 | 10·20 | 14 | ·83 | 4 | 1·32 | 4 | 4·21 | 6 | 3·93 | 11 |
| June . . . | 4·75 | 9 | 4·44 | 11 | 6·07 | 10 | 8·63 | 17 | 4·21 | 9 | ·00 | 0 | ·07 | 1 | 4·00 | 9 | 3·41 | 5 |
| July . . . | 2·77 | 9 | 2·60 | 17 | 5·32 | 6 | 1·66 | 9 | 4·00 | 9 | 0·14 | 1 | ·00 | 0 | ·51 | 6 | — | — |
| August . . | 4·91 | 13 | 5·24 | 16 | 1·50 | 6 | 1·54 | 11 | 4·18 | 11 | 1·75 | 4 | ·94 | 3 | 1·85 | 13 | — | — |
| September . | 2·05 | 9 | 2·35 | 7 | 5·01 | 15 | 1·77 | 7 | ·90 | 3 | ·00 | — | ·00 | 0 | 6·08 | 10 | — | — |
| October . . | 2·39 | 7 | ·56 | 3 | ? | ? | ·73 | 3 | 1·52 | 3 | ·18 | 1 | 2·87 | 7 | ·00 | 0 | 1·68 | 2 |
| November . | 27·67 | 12 | 23·40 | 20 | 21·20 | 16 | 12·96 | 14 | 19·24 | 17 | 6·85 | 12 | 12·00 | 26 | 1·97 | 8 | 8·83 | 20 |
| December. . | 4·86 | 3 | 3·39 | 7 | ·67 | 5 | 1·36 | 2 | — | — | 9·72 | 15 | 2·77 | 15 | ·00 | 0 | 2·29 | 8 |
| Year . . . | 65·62 | 95 | 56·91 | 112 | 52·80 | 85 | 41·29 | 92 | 49·18 | 76 | 22·81 | 48 | 25·95 | 73 | 18·69 | 53 | 27·40 | 71 |

[1] 3·10 inches on April 24.

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*Kibwezi. Lat. 2° 25′ S., Long. 37° 55′ E., 2990 feet. Observers: Rev. T. Watson, assisted by Matthew Wilson and John Paterson.*

| 1896 | Pressure of Atmosphere | | | Mean Temperature | | | | | | Temp. Extremes | | Mean Temp. Wet Bulb. | | | Dew-point | | | Vapour Pressure | | | Relative Humidity | | | Rain | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 7 a.m. | 2 p.m. | 9 p.m. | 7 a.m. | 2 p.m. | 9 p.m. | Max. | Min. | Mean | Highest | Lowest | 7 a.m. | 2 p.m. | 9 p.m. | 7 a.m. | 2 p.m. | 9 p.m. | 7 a.m. | 2 p.m. | 9 p.m. | 7 a.m. | 2 p.m. | 9 p.m. | Amount | Days | Heaviest Fall |
| | In. | In. | In. | ° | ° | ° | ° | ° | ° | ° | ° | | | | ° | ° | ° | In. | In. | In. | p.c. | p.c. | p.c. | In. | | In. |
| July . . | 27·079 | 27·014 | 27·054 | 60·7 | 78·8 | 67·1 | 84·3 | 55·2 | 68·4 | 91·5 | 50·0 | 58·4 | 65·0 | 61·3 | 57·0 | 57·8 | 58·1 | ·465 | ·478 | ·483 | 88 | 49 | 73 | ·004 | — | ·003 |
| August . | 27·057 | 26·989 | 27·036 | 61·4 | 79·8 | 67·1 | 84·8 | 55·9 | 68·8 | 91·0 | 49·7 | 59·5 | 65·7 | 61·8 | 58·4 | 58·5 | 59·0 | ·489 | ·490 | ·498 | 90 | 48 | 76 | ·14 | 2 | ·09 |
| September | 27·015 | 26·929 | 26·981 | 62·1 | 86·4 | 69·9 | 91·5 | 57·0 | 72·1 | 96·0 | 51·0 | 59·0 | 68·4 | 63·0 | 57·2 | 59·8 | 59·4 | ·468 | ·513 | ·506 | 84 | 41 | 70 | ·10 | 2 | ·07 |
| October . | 27·007 | 26·904 | 26·958 | 66·2 | 88·5 | 73·3 | 93·6 | 61·9 | 75·3 | 97·7 | 54·0 | 64·2 | 70·6 | 66·0 | 63·2 | 62·6 | 62·0 | ·579 | ·568 | ·555 | 90 | 42 | 67 | ·53 | 4 | ·32 |
| November | 26·912 | 26·875 | 26·908 | 67·2 | 79·1 | 68·7 | 83·5 | 64·1 | 70·9 | 89·7 | 61·2 | 66·5 | 71·1 | 67·3 | 66·2 | 67·8 | 66·7 | ·642 | ·680 | ·653 | 97 | 68 | 93 | 8·60 | 26 | 1·40 |
| December | 26·944 | 26·891 | 26·930 | 67·7 | 80·3 | 67·2 | 84·8 | 63·1 | 70·6 | 87·7 | 56·5 | 67·3 | 72·6 | 66·2 | 67·1 | 69·6 | 65·8 | ·663 | ·722 | ·633 | 98 | 70 | 95 | 4·55 | 15 | 1·08 |

The barometrical observations have been reduced to 32° F., and to Lat. 45°.
The mean temperature is assumed to be = ¼(7+2+9+9). The mean for the six months is 71°·0. A mean deduced from ½(max.+min.) would be 73°·0, or 2°·3 too high.

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*Kibwezi. Means of Hourly Observations, July to September* 1896.

| Hours | July 11 and 21 | | | | | August 1, 11, and 21 | | | | | September 1, 11, and 21 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Barometer | Thermometer | | Vapour Pressure | Relative Humidity | Barometer | Thermometer | | Vapour Pressure | Relative Humidity | Barometer | Thermometer | | Vapour Pressure | Relative Humidity |
| | | Dry | Wet | | | | Dry | Wet | | | | Dry | Wet | | |
| | Inches | ° | ° | Inches | p.c. | Inches | ° | ° | Inches | p.c. | Inches | ° | ° | Inches | p.c. |
| Midnight . | 27·118 | 60·7 | 58·4 | ·465 | 87 | 27·056 | 64·7 | 62·3 | ·537 | 88 | 27·026 | 61·2 | 58·1 | ·452 | 84 |
| 1 a.m. . . | 27·085 | 59·4 | 57·2 | ·446 | 88 | 27·096 | 64·5 | 62·0 | ·530 | 87 | 27·008 | 59·2 | 56·7 | ·435 | 87 |
| 2 a.m. . . | 27·074 | 57·9 | 56·4 | ·440 | 90 | 27·039 | 64·3 | 62·0 | ·532 | 88 | 26·993 | 57·5 | 55·3 | ·415 | 88 |
| 3 a.m. . . | 27·085 | 57·4 | 55·7 | ·426 | 90 | 27·034 | 64·0 | 61·7 | ·526 | 88 | 26·991 | 57·4 | 54·9 | ·406 | 86 |
| 4 a.m. . . | 27·093 | 56·0 | 54·6 | ·412 | 92 | 27·049 | 63·1 | 61·8 | ·538 | 93 | 26·991 | 55·5 | 53·7 | ·394 | 90 |
| 5 a.m. . . | 27·099 | 55·5 | 54·4 | ·412 | 93 | 27·043 | 62·5 | 61·2 | ·526 | 93 | 27·018 | 54·1 | 52·6 | ·381 | 91 |
| 6 a.m. . . | 27·088 | 55·2 | 54·2 | ·410 | 93 | 27·041 | 61·6 | 60·2 | ·507 | 92 | 27·009 | 53·2 | 51·7 | ·368 | 91 |
| 7 a.m. . . | 27·104 | 61·0 | 58·7 | ·471 | 87 | 27·058 | 63·0 | 61·3 | ·524 | 92 | 27·031 | 58·9 | 54·0 | ·368 | 74 |
| 8 a.m. . . | 27·129 | 63·9 | 61·0 | ·507 | 85 | 27·093 | 66·5 | 63·2 | ·546 | 84 | 27·052 | 70·1 | 62·6 | ·492 | 67 |
| 9 a.m. . . | 27·137 | 72·7 | 64·6 | ·527 | 66 | 27·083 | 69·8 | 64·0 | ·541 | 74 | 27·052 | 75·2 | 64·7 | ·505 | 58 |
| 10 a.m. . . | 27·135 | 74·5 | 63·7 | ·481 | 56 | 27·082 | 72·2 | 64·7 | ·535 | 68 | 27·045 | 80·7 | 65·3 | ·469 | 45 |
| 11 a.m. . . | 27·125 | 77·9 | 64·9 | ·484 | 51 | 27·069 | 73·5 | 64·7 | ·522 | 63 | 27·028 | 82·2 | 65·3 | ·454 | 41 |
| Noon . . | 27·108 | 78·7 | 65·5 | ·495 | 50 | 27·042 | 74·3 | 65·2 | ·468 | 55 | 26·997 | 86·2 | 67·4 | ·482 | 38 |
| 1 p.m. . . | 27·082 | 77·2 | 64·0 | ·463 | 49 | 27·018 | 75·2 | 64·9 | ·511 | 59 | 26·980 | 87·5 | 67·7 | ·479 | 36 |
| 2 p.m. . . | 27·068 | 76·9 | 63·7 | ·457 | 49 | 26·994 | 75·5 | 65·1 | ·514 | 59 | 26·931 | 88·0 | 67·4 | ·464 | 35 |
| 3 p.m. . . | 27·058 | 76·5 | 64·0 | ·469 | 51 | 26·981 | 76·6 | 65·5 | ·516 | 57 | 26·917 | 86·5 | 67·2 | ·472 | 37 |
| 4 p.m. . . | 27·053 | 76·0 | 63·5 | ·460 | 52 | 26·990 | 75·7 | 64·9 | ·506 | 57 | 26·912 | 84·7 | 67·2 | ·490 | 41 |
| 5 p.m. . . | 27·061 | 74·9 | 63·4 | ·468 | 55 | 26·977 | 73·8 | 64·5 | ·513 | 62 | 26·940 | 81·8 | 65·2 | ·455 | 42 |
| 6 p.m. . . | 27·066 | 72·9 | 63·4 | ·488 | 60 | 26·986 | 71·9 | 63·7 | ·507 | 65 | 26·949 | 77·5 | 63·6 | ·448 | 48 |
| 7 p.m. . . | 27·077 | 71·6 | 62·2 | ·465 | 60 | 27·002 | 69·1 | 63·3 | ·523 | 73 | 26·957 | 73·9 | 62·8 | ·460 | 55 |
| 8 p.m. . . | 27·098 | 70·2 | 61·5 | ·458 | 60 | 27·032 | 67·1 | 62·1 | ·507 | 74 | 26·964 | 71·2 | 62·6 | ·481 | 63 |
| 9 p.m. . . | 27·107 | 68·5 | 61·5 | ·475 | 67 | 27·048 | 66·2 | 61·5 | ·498 | 77 | 27·003 | 68·7 | 61·6 | ·476 | 68 |
| 10 p.m. . . | 27·137 | 66·5 | 61·5 | ·495 | 76 | 27·053 | 65·7 | 61·6 | ·506 | 80 | 27·014 | 66·1 | 61·1 | ·488 | 77 |
| 11 p.m. . . | 27·139 | 64·9 | 61·0 | ·497 | 81 | 27·067 | 64·9 | 61·4 | ·508 | 82 | 27·014 | 64·7 | 60·9 | ·496 | 81 |
| Mean . . | 27·097 | 67·8 | 60·8 | ·465 | 70 | 27·038 | 68·6 | 63·0 | ·518 | 75 | 26·993 | 70·9 | 61·2 | ·450 | 63 |

*Kibwezi.*—The instruments used since July are those supplied by the Committee of the British Association. The barometer observations have been reduced to 32° F., and to 45° N. lat., but not to the sea-level. Vapour pressure, dew-point, and relative humidity have been computed from Tables 40 to 42 in the *Smithsonian Meteorological Tables*, 5th edit., 1893.

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*Kibweci (Continued). Means of Hourly Observations, October to December 1896.*

| Hours | October 1, 11, and 21 | | | | | November 1, 11, and 21 | | | | | December 1 and 21 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Barometer | Thermometer | | Vapour Pressure | Relative Humidity | Barometer | Thermometer | | Vapour Pressure | Relative Humidity | Barometer | Thermometer | | Vapour Pressure | Relative Humidity |
| | | Dry | Wet | | | | Dry | Wet | | | | Dry | Wet | | |
| | Inches | ° | ° | Inches | p.c. | Inches | ° | ° | Inches | p.c. | Inches | ° | ° | Inches | p.c. |
| Midnight . | 27·013 | 66·7 | 63·7 | ·559 | 86 | 26·919 | 68·5 | 67·5 | ·662 | 95 | 26·883 | 66·7 | 66·5 | ·647 | 99 |
| 1 a.m. . . | 26·942 | 65·4 | 62·9 | ·548 | 87 | 26·913 | 67·6 | 66·6 | ·641 | 96 | 26·888 | 66·9 | 66·5 | ·645 | 98 |
| 2 a.m. . . | 26·965 | 64·2 | 62·1 | ·536 | 89 | 26·907 | 67·3 | 66·3 | ·635 | 95 | 26·888 | 66·5 | 66·5 | ·649 | 100 |
| 3 a.m. . . | 26·970 | 62·4 | 61·3 | ·530 | 94 | 26·904 | 66·6 | 66·0 | ·632 | 97 | 26·888 | 66·4 | 66·4 | ·649 | 100 |
| 4 a.m. . . | 26·985 | 62·5 | 60·9 | ·518 | 91 | 26·905 | 66·1 | 65·5 | ·621 | 97 | 26·889 | 66·6 | 66·5 | ·648 | 99 |
| 5 a.m. . . | 26·992 | 62·2 | 60·5 | ·509 | 91 | 26·909 | 66·3 | 65·7 | ·625 | 97 | 26·889 | 66·5 | 66·5 | ·649 | 100 |
| 6 a.m. . . | 27·000 | 61·7 | 60·2 | ·506 | 92 | 26·917 | 66·3 | 65·6 | ·622 | 97 | 26·889 | 66·0 | 66·0 | ·638 | 100 |
| 7 a.m. . . | 27·008 | 64·7 | 62·3 | ·537 | 88 | 26·927 | 67·9 | 66·8 | ·645 | 95 | 26·891 | 67·0 | 66·9 | ·657 | 99 |
| 8 a.m. . . | 27·019 | 70·5 | 65·7 | ·583 | 78 | 26·947 | 70·3 | 67·8 | ·654 | 89 | 26·891 | 69·5 | 68·2 | ·677 | 94 |
| 9 a.m. . . | 27·032 | 75·0 | 66·9 | ·577 | 66 | 26·947 | 75·0 | 69·2 | ·654 | 75 | 26·889 | 70·2 | 68·5 | ·678 | 92 |
| 10 a.m. . . | 27·018 | 80·1 | 67·1 | ·533 | 52 | 26·942 | 77·6 | 70·3 | ·666 | 70 | 26·888 | 73·1 | 70·2 | ·709 | 87 |
| 11 a.m. . . | 26·992 | 85·2 | 70·6 | ·601 | 49 | 26·915 | 78·5 | 70·3 | ·657 | 67 | 26·885 | 76·7 | 72·0 | ·736 | 80 |
| Noon . . | 26·956 | 86·6 | 70·2 | ·573 | 45 | 26·910 | 80·1 | 70·7 | ·656 | 64 | 26·883 | 76·5 | 71·0 | ·702 | 77 |
| 1 p.m. . . | 26·924 | 88·3 | 70·6 | ·570 | 43 | 26·800 | 80·0 | 70·7 | ·657 | 65 | 26·883 | 72·3 | 68·7 | ·666 | 83 |
| 2 p.m. . . | 26·903 | 88·8 | 70·7 | ·569 | 42 | 26·868 | 80·5 | 71·6 | ·684 | 66 | 26·881 | 75·5 | 70·4 | ·690 | 78 |
| 3 p.m. . . | 26·883 | 87·7 | 69·4 | ·534 | 42 | 26·860 | 80·8 | 69·7 | ·614 | 58 | 26·883 | 76·0 | 70·7 | ·699 | 77 |
| 4 p.m. . . | 26·871 | 86·7 | 68·8 | ·524 | 42 | 26·879 | 76·4 | 69·7 | ·658 | 72 | 26·883 | 75·0 | 71·1 | ·721 | 83 |
| 5 p.m. . . | 26·893 | 84·2 | 67·7 | ·512 | 43 | 26·874 | 74·8 | 69·2 | ·656 | 76 | 26·882 | 74·1 | 71·0 | ·726 | 86 |
| 6 p.m. . . | 26·892 | 80·2 | 66·7 | ·519 | 51 | 26·887 | 70·7 | 68·0 | ·657 | 87 | 26·883 | 71·9 | 70·4 | ·726 | 91 |
| 7 p.m. . . | 26·911 | 77·1 | 66·4 | ·540 | 58 | 26·897 | 69·3 | 68·2 | ·677 | 95 | 26·900 | 69·5 | 68·2 | ·677 | 94 |
| 8 p.m. . . | 26·942 | 75·2 | 65·2 | ·521 | 60 | 26·913 | 68·2 | 67·0 | ·649 | 94 | 26·905 | 68·1 | 67·4 | ·661 | 97 |
| 9 p.m. . . | 26·953 | 72·7 | 65·3 | ·549 | 68 | 26·927 | 67·9 | 66·8 | ·645 | 95 | 26·916 | 67·5 | 66·7 | ·648 | 97 |
| 10 p.m. . . | 26·986 | 70·5 | 65·2 | ·567 | 76 | 26·930 | 67·4 | 66·3 | ·634 | 95 | 26·918 | 66·7 | 66·2 | ·639 | 98 |
| 11 p.m. . . | 26·988 | 69·5 | 64·4 | ·553 | 77 | 26·927 | 67·7 | 66·6 | ·640 | 95 | 26·923 | 67·0 | 65·9 | ·624 | 95 |
| Mean . . | 26·960 | 74·5 | 65·6 | ·544 | 67 | 26·909 | 71·7 | 68·0 | ·648 | 84 | 26·891 | 70·1 | 68·3 | ·673 | 92 |

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*Mumia's, Kavirondo. Lat.* 0° 20′ *N., Long.* 34° 30′ *E.,* 4000 *feet. Observer: C. W. Hobley, Mem. Inst. C.E.*

| 1896-97 | Rain-fall | | |
|---|---|---|---|
| | Amount | Days | Heaviest Fall in 24 hours |
| | Inch | | Inch |
| February 1896 | ·79 | 3 | ·45 |
| March | 4·18 | 11 | 1·32 |
| April | 3·96 | 16 | 1·36 |
| May | 7·29 | 15 | 2·71 |
| June | 6·14 | 18 | 1·58 |
| July | 6·70 | 17 | 1·40 |
| August | 6·67 | 20 | 1·22 |
| September | 5·13 | 19 | 1·66 |
| October | 4·61 | 17 | 1·02 |
| November | 8·13 | 21 | 1·36 |
| December | 1·63 | 6 | ·67 |
| January 1897 | 3·53 | 10 | 1·02 |
| Totals | 58·76 | 173 | — |

*Kibwezi. Lat.* 2° 25′ *S., Long.* 37° 55′ *E.,* 2990 *feet.*

| 1896 | Rain-fall | | |
|---|---|---|---|
| | Amount | Days | Heaviest Fall |
| | Inch | | Inch |
| January | ·93 | 5 | ·45 |
| February | 1·79 | 4 | 1·63 |
| March | 1·87 | 7 | ·82 |
| April | 2·81 | 11 | 1·06 |
| May | ·35 | 4 | ·17 |
| June | ·01 | 1 | ·01 |
| July | ·004 | — | ·003 |
| August | ·14 | 2 | ·09 |
| September | ·10 | 2 | ·07 |
| October | ·53 | 4 | ·32 |
| November | 8·60 | 26 | 1·40 |
| December | 4·55 | 15 | 1·08 |
| Year 1896 | 21·68 | 81 | 1·63 |
| ,, 1895 | 33·11 | 90 | 2·68 |
| ,, 1894 | 26·73 | 44 | 3·34 |

According to the local authorities the rain-fall at Mumia's in 1896 was far below the average. Nearly the whole of the rain-fall took place between 2 and 7 p.m. The rain was nearly always accompanied by thunder. Most of the rain occurs with an easterly wind blowing from the highlands in the direction of the lake. The rain-gauge was by Casella, 8 in. in diameter, and had been procured through the Meteorological Office (MO. 364).

*Earth Temperatures.* At *Mumia's*, on March 1, 1897, at 5.30 p.m., Mr. Hobley lowered one of Symons's earth thermometers to a depth of 3 feet below the surface, the temperature of the air at the time being 71° F. and that of the earth thermometer 72°. On March 3, 1897, at 5 p.m., the air temperature being 72° F., the earth thermometer was withdrawn, and was found to indicate a temperature of 77° F.

A similar experiment was made at *Mongichi's*, on the southern slope of Mount Elgon, at an elevation of 5000 feet, when the earth temperature, at a depth of 3 feet, was found to be 71° F.

The result obtained at Mongichi's approximates to the mean temperature of the year; that at Mumia's is clearly too high. We are promised a systematic series of these earth temperatures.

## *Variations in the Level of Victoria Nyanza.*

| Months | Mean Lake Level | | | Fluctuations | | | Rain-fall Port Alice | |
|---|---|---|---|---|---|---|---|---|
| | Port Alice | Lubwa | Port Victoria | Port Alice | Lubwa | Port Victoria | | |
| 1896 | In. | In. | In. | In. | In. | In. | In. | Days |
| January | 7·1 | 5·6 | 6·6 | 3·0 | 2·5 | 3·7 | — | 4 |
| February | 4·4 | 3·5 | 4·4 | 3·0 | 5·5 | 5·5 | — | — |
| March | 2·2 | 2·9 | 3·3 | 3·5 | 5·6 | 6·7 | — | — |
| April | 3·1 | 3·2 | 3·0 | 2·0 | 5·7 | 3·5 | 8·61 | 18 |
| May | 3·0 | 3·7 | 3·2 | 2·0 | 5·0 | 2·0 | 4·45 | 15 |
| June | 1·5 | 2·5 | 2·4 | 2·0 | 2·7 | 4·0 | 3·18 | 8 |
| July | 0·9 | −0·1 | −0·2 | 3·0 | 5·0 | 4·0 | 0·31 | 5 |
| August | −1·0 | −1·5 | −2·2 | 2·0 | 3·0 | 3·0 | 4·10 | 12 |
| September | −4·9 | −4·3 | −5·3 | 4·5 | 6·2 | 5·0 | 2·37 | 5 |
| October | −8·4 | −8·2 | −8·6 | 4·0 | 5·5 | 3·5 | 4·59 | 11 |
| November | −5·1 | −4·8 | −3·7 | 7·7 | 10·5 | 8·5 | 12·05 | 25 |
| December | −1·8 | −2·6 | −2·3 | 2·7 | 4·2 | 3·0 | 4·69 | 10 |
| Year (Mean) | −0·0 | 0·0 | 0·0 | 3·3 | 5·1 | 4·4 | — | — |
| 1897 | | | | | | | | |
| January | −2·0 | −2·8 | −2·5 | 2·5 | 2·5 | 2·75 | 1·75 | 5 |
| February | −2·2 | −1·0 | −0·7 | 2·0 | 4·0 | 3·00 | 2·62 | 13 |

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*Variations in the Level of Victoria Nyanza.*

| Decades 1896 | | Lake Level | | | Rain | | |
|---|---|---|---|---|---|---|---|
| | | Port Alice | Lubwa | Port Victoria | Port Alice | | Port Victoria |
| | | | | | Amount | Days | Days |
| | | In. | In. | In. | In. | | |
| January | I | 7·8 | — | 6·9 | — | — | — |
| | II | 7·1 | — | 6·7 | — | — | — |
| | III | 6·1 | — | 6·3 | — | — | — |
| February | I | 5·7 | 4·4 | 5·9 | — | — | — |
| | II | 4·6 | 3·3 | 4·3 | — | — | — |
| | III | 2·9 | 2·5 | 3·6 | — | — | — |
| March | I | 1·9 | 2·2 | 2·8 | — | — | — |
| | II | 1·1 | 3·3 | 3·5 | — | — | — |
| | III | 2·2 | 3·2 | 3·4 | — | — | — |
| April | I | 2·7 | 2·3 | 2·2 | 15·40 | 4 | — |
| | II | 3·2 | 3·9 | 3·4 | 3·90 | 8 | — |
| | III | 3·9 | 3·4 | 3·4 | 3·17 | 6 | — |
| May | I | 3·5 | 3·0 | 3·4 | ·85 | 6 | — |
| | II | 2·9 | 4·2 | 3·3 | 2·33 | 4 | — |
| | III | 2·5 | 3·7 | 2·8 | 1·27 | 5 | — |
| June | I | 1·1 | 2·9 | 2·4 | 2·46 | 5 | — |
| | II | 1·2 | 2·2 | 2·5 | ·26 | 1 | — |
| | III | 2·1 | 2·3 | 2·1 | ·46 | 2 | — |
| July | I | 2·2 | 1·2 | 1·2 | ·08 | 2 | 2 |
| | II | ·7 | − ·2 | − ·1 | ·20 | 2 | 0 |
| | III | ·0 | − 1·2 | − 1·7 | ·03 | 1 | 0 |
| August | I | − 0·6 | − 2·1 | − 2·3 | 2·04 | 6 | 5 |
| | II | − 1·0 | − ·8 | − 2·4 | 2·06 | 6 | 3 |
| | III | − 1·3 | − 1·5 | − 2·0 | ·00 | — | 0 |
| September | I | − 3·8 | − 2·8 | − 4·1 | ·20 | 2 | 2 |
| | II | − 5·1 | − 4·1 | − 5·2 | ·87 | 2 | 5 |
| | III | − 5·9 | − 6·1 | − 6·7 | 1·30 | 1 | 0 |
| October | I | − 7·5 | − 7·0 | − 7·3 | ·38 | 2 | 0 |
| | II | − 10·0 | − 8·7 | − 8·8 | 1·34 | 3 | 2 |
| | III | − 9·8 | − 8·8 | − 9·7 | 2·87 | 6 | 6 |
| November | I | − 8·6 | − 8·7 | − 7·6 | 3·66 | 10 | 9 |
| | II | − 4·4 | − 4·2 | − 2·7 | 7·21 | 8 | 6 |
| | III | − 2·3 | − 1·7 | − 1·0 | 1·18 | 7 | 2 |
| December | I | − 0·9 | − 2·3 | − 1·7 | 3·46 | 4 | 2 |
| | II | − 2·1 | − 2·2 | − 2·7 | ·97 | 3 | 0 |
| | III | − 2·2 | − 3·4 | − 2·4 | ·21 | 3 | 0 |
| Year (Mean) | | 0·0 | 0·0 | 0·0 | — | — | — |
| January (1897) | I | − 3·0 | − 3·5 | − 3·5 | ·08 | 2 | 1 |
| | II | − 2·7 | − 2·5 | − 2·1 | ·47 | 2 | 5 |
| | III | − 1·9 | − 2·6 | − 1·9 | 1·20 | 2 | 0 |
| February | I | − 3·0 | − 1·50 | − 1·55 | 1·21 | 7 | 6 |
| | II | − 2·0 | − 0·80 | − ·17 | ·59 | 3 | 2 |
| | III | − 1·7 | − 1·96 | − ·44 | 1·82 | 3 | 1 |

## NOTES

The observations on the rise and fall of the level of Victoria Nyanza were begun in January 1896, by direction of Mr. Ernest J. L. Berkeley, H. M.'s Commissioner, who placed this work under the charge of Mr. R. J. D. Macallister. There are at present three stations—

*Port Alice*, or *Ntebe*, the Lake Port of the Capital. The observations are made daily at noon. The observers were Major A. E. Smith (January), Mr. Alex. Geo. Boyle (February to September), and Mr. Fred. Pordage.

*Lubwa*, near the outlet of the Victoria Nile. Observer, up to the beginning of February 1897, Mr. W. Grant.

*Port Victoria*, on Berkeley Gulf, in the N.E. corner of the lake. Observer, up to the end of 1896, Mr. R. J. D. Macallister; since that time, Mr. C. W. Fowler.

At Lubwa and Port Victoria the observations are made at 9.30 a.m. Observations on the rain-fall are made at Port Alice only, no gauges being available.

Care has been taken, when fixing the gauges, to prevent a subsequent settlement.

On beginning their work the observers were of necessity compelled to choose an arbitrary datum level. In our abstract the datum level accepted is the mean level of the lake during 1896.

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In the accompanying tables, the results are given by decades, as also by months.

In examining this interesting record it will be found that the influence of the *rain-fall* upon the level of the lake is not so immediately apparent as might have been expected. Thus a rain-fall of 2·36 in. on November 14, 1896, only caused a rise of the lake to the extent of 0·75 in., and the heavy rains during October and November (16·64 in.) influenced the lake-level to the extent of only about 5 in. Evaporation, no doubt, as also the irregular distribution of the rains over a lake covering an area of 25,000 sq. miles, go far to explain this.

The *winds* exercise a decided influence upon the level. They are regular land and lake breezes, blowing off-shore (from the E. or N.E.) in the morning, and changing about noon to W. or S.W. The lake breezes are more especially important, and Mr. Macallister remarks that a strong S.W breeze will cause a rise in the level of the lake to the extent of from 1 to 3 in.

As the observations at two of the stations are made in the morning, the actual mean level is probably a little higher than it is made to appear from our abstract. In order to trace the influence of the wind upon the lake level it would be necessary to establish a self-registering gauge, or to make observations at least thrice daily.

Taking the mean of the three stations, we find that on January 1, the level stood 7·8 in. above the datum, whilst on December 31, it was 3 3 in. below it, a difference of 11·1 in. The level was highest in the beginning of the years; lowest (–9·2 in.) during the second decade of October. The extreme range amounted to 18·2 in. (Port Alice 19·0 in., Lubwa 17·5 in., Port Victoria 18·2 in.)

It is desirable that similar observations should be made on the S.E. and W. shores of the lake. The connection of these stations by lines of spirit levelling can hardly be looked for, for many years to come.

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# APPENDIX D

## NOTES ON AMERICAN RUBBER-PRODUCING TREES

### THEIR HABITAT, CULTIVATION, AND YIELD.

*Report by Mr. Robert Cross on the Investigation and Collecting of Plants and Seeds of the Indiarubber Trees of Pará and Ceará.*[1]

"TO THE UNDER-SECRETARY OF STATE FOR INDIA.

"*Grove Street, Edinburgh,*
"*March* 29, 1877.

"SIR,

"Respecting the service on which I have recently been employed in the collecting of plants yielding the Pará india-rubber of commerce, I now take the liberty to forward a detailed account of my proceedings.

"On June 10, 1876, I left Liverpool by the 'Red Cross' steamer *Cearense*, which, after calling at Havre and Lisbon, sailed direct for Pará, which was reached on July 15. This city is situated on the southern bank of the river Amazon, which, at the point where it debouches to the sea, has a breadth of thirty-three miles. Pará is distant eighty miles from the ocean. . . .

"I found on arrival, after considerable inquiry, that the great field for caoutchouc collecting was the province of Pará and the islands which are scattered over the lower portion of the Amazon river. Chief of these is the island of Marajo, which is about the size of Holland. A good deal of the rubber from the Rio Negro, Madeira, and other tributaries, appears to come in the form of 'negrohead,' or *sernamby*, while the Pará region seems to produce to a greater extent the finer kinds of smoked biscuit rubber; the preparation is attended to more carefully, besides which, the Pará tree is

[1] Reprinted by permission of the Secretary of State for India. The section dealing with Balsam of Copaiba is omitted.



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reported to be a different variety. Its milk leaves no very prominent stain on the hands or clothing, while the milk of some of the varieties of rubber of the Upper Amazon gives a black ink-like mark to the hands and clothes of the collectors. Black rubber is stated by some to be deficient in recoil or elasticity. In order to form and establish a collection of plants, and for the purpose of making the various observations on the soil, climate, and mode of collecting and preparing the rubber, it was necessary to obtain a place to live in while so employed. Every one told me I would experience great difficulty in finding a dwelling, and this proved true. After travelling round Pará and searching for about eight days, I succeeded in hiring a house, but at a very high rate, as the place was large and adapted for a family with attendants and slaves. However, it was secure, and offered every facility for my various requirements, which was important. My next work was to examine the district where the rubber trees grew. Mr. Henderson, who was known to Dr. Spruce, kindly introduced me to an old rubber-collector called Don Henrique, who undertook to lead the way to the *seringal*, as the rubber locality is termed, but after disappointing me twice, I resolved to lose no more time, and procuring from him the services of a lad as guide, I commenced to inspect the forest. On July 25 I made a preliminary journey to the region where the trees were wrought.

"The land around Pará, including where the city stands, rises from the banks of the river southward in the form of gentle undulations, indented, however, in many places by deep, gully-like natural ditches, called *gapos*, which often penetrate for many miles into the interior of this vast forest region, and are filled daily by diurnal tides. To those navigable by canoes or sailing craft, the term *ajacape* is often applied. The intervening land between the *gapos* is frequently flat and moist, and owes its origin first to tidal deposits, and afterwards is raised higher by the decayed remains of successional rank growths of vegetation. At a similar level to this, we find a deposit approaching to clay or very fine sand and mud, with here and there masses of sandstone or granite cropping out. In every direction where a view can be obtained, the country is seen to be covered by dense exuberant forest. Leaving Pará, I travelled over the high ground for several miles, until the primitive forest was reached, and then went down towards the *gapos;* following through the wood a path used by the caoutchouc collectors, we soon came to a large tree in a state of decay, which had

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been tapped many times. At first sight I felt extremely puzzled and perplexed at the appearance it presented. From the ground up to a height of 10 or 12 feet, the trunk was one swollen mass of warty protuberances and knots, covered with thick scales and flakes of hard dry bark.

"This singular state of growth, the result of the practised system of tapping, has not yet been recorded by any one, and so to me was unexpected. A few minutes of careful examination soon showed the cause of these deformities. The collector makes use of a small axe-like instrument, an inch broad. At each stroke he cuts through the bark and into the wood for fully an inch. Hundreds of these are made in the wood of each tree in the course of a few years, and cannot heal under any circumstances, but a layer of wood is formed over the injured part, at the expense of the bark and general vitality of the tree. The newly-formed wood is again cut into and splintered, and so the process is repeated on each successive layer, and the trunk becomes merely a mass of twisted, wrinkled wood, with very thin insipid bark. In this condition hardly any milk flows from the cuts, and although for years a few green leaves may continue to sprout from the point of the twigs, yet the tree may be considered as dead, and, in fact, finally withers away. It is therefore the injury done to the wood, and not overtapping, which lessens the flow of the milk and ultimately causes the death of the tree. The cuts in the wood are of course unnecessary, since the milk is met with only in the bark. The healing-over process which afterwards takes place, is similar to that seen where a branch has been lopped from a trunk. The wood is compact and rather hard, and for this reason the tree lives on for a number of years, although cut and hacked every season; but the flow of milk becomes so lessened, that many are practically abandoned for years before they die. This and several large adjoining trees were growing in moist, deep, heavy soil of a fertile character, but quite out of the reach of any inundation.

"On August 2 I went in search of plants, and descended to the region of the *gapos*. It had rained a good deal previously, and the collectors' footpaths were ankle-deep in mud. After wading several little pools, we came to a deep *gapo*, into which the tide flowed. It was connected with several lesser watercourses, which formed a kind of network, extending over a wide district of forest-covered country, the more elevated parts of which were raised only from 3 to 4 feet above the highest tides. A considerable number of

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rubber trees grew along the margins of both the larger and smaller streams, intermixed with cacao and forest trees. Three were observed, the base of the trunks of which were flooded to a height of 1 foot, yet the roots seemed to run up to the brow of the bank, and no matted rootlets were observed, as is the case with the willow tree when growing on the margin of a rivulet. Most of the others occupied dry situations. Those *gapo* ditches were lined with soft rich mud, no doubt possessing great fertility. The exhalations from such places, shrouded by a forest-growth of 80 to 100 feet high, were sensibly felt, and on nearly every occasion when I visited these localities, I experienced slight attacks of fever afterwards. The collectors also, during the working season, are often indisposed from the same cause. Although the forest was excessively damp, yet tapping was being carried on, as a man was seen mixing up some clay at the side of a *gapo*. A number of good plants were met with beneath the oldest trees. The seedlings did not usually grow in any place where the ground was covered by more than 2 or 3 inches of water at flood-tide. However, by far the greatest number were met with on sites above the reach of the highest tides. I measured a few of the largest trees, all of which had been tapped for periods varying from five to fifteen years. Those found growing in shallow *gapo* ditches are preceded by an asterisk. The circumference of each one yard from the ground was as follows—

| | Ft. | In. | | Ft. | In. |
|---|---|---|---|---|---|
| No. 1 ... | 6 | 9 | No. 7 ... | 4 | 0 |
| „ 2 ... | 6 | 10 | „ 8 ... | 5 | 10 |
| „ 3 ... | 4 | 7 | „ 9 ... | 4 | 0 |
| „ 4 ... | 3 | 0 | „ 10 ... | 4 | 6 |
| * „ 5 ... | 5 | 10 | „ 11 ... | 4 | 8 |
| „ 6 ... | 5 | 3 | * „ 12 ... | 2 | 8 |

Most trees occurring within the limits of the worked district are tapped if possessing a diameter of 6 or 8 inches. Regularly tapped trees do not, as a rule, exceed 60 feet in height.

"*August* 7.—I went in search of more plants, and on the 10th made another collection. About 2000 in all were obtained, but a number had to be rejected. I had cases previously made, so that I was able to plant the plants in them without delay. The soil consisted of decayed leaves brought from the forest. The rougher portions were charred and put into the bottoms of the cases, to serve as a sort of

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drainage. Then a layer mixed with some wood-ashes was placed above the plants planted therein. Four cases, containing upwards of 1000 plants, were finished in this way, one being reserved for the copaiba, or any other sort of rubber plants I might meet with. While the plants were being established, I commenced a series of experiments, in order to ascertain how the tree might be readily multiplied in a simple rough way by any person not specially acquainted with the principles of propagation. Two separate beds, the one of brown sand, the other of decayed leaves, were formed. The terminal portion of shoots, but with a bud at the lower end, were planted in the beds in a reclining position, with only 2 inches of the buds above the ground. Owing to the great distance between the buds, consequent on vigorous growth, many of the cuttings were a foot or more in length. At the same time a number were set in an open vessel containing only rain-water. The cuttings in the sand-bed were the first to grow, and soon made strong shoots and root-fibres. Those in the leaf-mould pushed more slowly, but developed green leaflets of great substance. The cuttings placed in the water had a small portion of tap-root at the base, as the object was to determine if the roots would actually develop in water alone. Within fourteen days these plants had several roots formed, and one or two rather weak growths came up, but a few days after I had thrown into the water some burnt earth and wood-ashes, the increase in vigour was very apparent. After these experiments, I felt convinced that the Pará rubber tree delights in abundance of moisture and rich fertile deposits.

"*Method adopted in tapping the trees.*—When the plants were somewhat established, I resolved to examine attentively the process of tapping as practised by the caoutchouc collectors. In the investigation of the subject, I travelled over a very wide extent of flat forest country, much divided by miry hollows and tidal *gapos*, which stretched along the bank of the river Guamá. Although the river is at least three times as broad as the Thames at London Bridge, it is not to be seen on any ordinary map. In the region alluded to there were hundreds of trees wrought by different collectors, each of whom had a separate piece of land to work on. When on these excursions, I had to go away from my place of abode at about three o'clock in the morning, as I had some miles to travel over paths not always in good condition, and it was necessary to be as near as possible to the spot where the tapping operations were performed, because the collectors

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begin to work immediately at daybreak, or as soon as they can see to move about among the trees. They say that the milk flows more freely and in greater quantities at early morn. I do not attach much importance to this statement, but I have recorded it. Another and more probable reason is, that as rain often falls about two or three o'clock in the afternoon, the tapping must be done early, as in the event of a shower the milk would be spattered about and lost. The collector, first of all, at the beginning of the dry season, goes round and lays down at the base of each tree a certain number of small cups of burnt clay. At the lesser trees only three or four are put, but at the larger ones from eight to twelve are deposited. The footpaths leading from tree to tree are likewise cleared of sapling growth, and the bridges over the *gapos* formed at each place by the trunk of a tree are, where necessary, replaced. On proceeding to his work, the collector takes with him a small axe for tapping, and a wicker basket containing a good-sized ball of well-wrought clay. He usually has likewise a bag for the waste droppings of rubber, and for what may adhere to the bottoms of the cups. These promiscuous gatherings are termed *sernamby*, and are the 'negrohead' of the English market. The cups, as already stated, are of burnt clay, and are sometimes round, but more frequently flat or slightly concave on one side, so as to stick easily when with a small portion of clay they are stuck against the trunk of the tree. The contents of fifteen cups make one English imperial pint. Arriving at a tree, the collector takes the axe in his right hand, and, striking in an upward direction as high as he can reach, makes a deep, upward-sloping cut across the trunk, which always goes through the bark and penetrates an inch or more into the wood. The cut is an inch in breadth. Frequently a small portion of bark breaks off from the upper side, and occasionally a thin splinter of wood is also raised. Quickly stooping down, he takes a cup, and pasting on a small quantity of clay on the flat side, presses it to the trunk close beneath the cut. By this time the milk, which is of dazzling whiteness, is beginning to exude, so that, if necessary, he so smoothes the clay that it may trickle directly into the cup. At a distance of 4 or 5 inches, but at the same height, another cup is luted on, and so the process is continued until a row of cups encircles the tree at a height of about 6 feet from the ground. Tree after tree is treated in like manner, until the tapping required for the day is done. This work should be concluded by nine or ten o'clock in the morning, because the milk continues to

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exude slowly from the cuts for three hours, or perhaps longer. I may state that there is a great difference among collectors in the performance of those duties. Some take care to get good clay previously and incorporate it well, so that a very small portion is necessary to lute the cups to the trunks; they also work with neatness and intelligence, and invariably collect a good quantity of milk. Others, again, do not take the trouble to prepare clay beforehand, but merely scrape up a handful when they require it at the side of a *gapo*, which is often of little consistence, so that a large quantity is required to fasten the cups. This class of collectors have often many fragments of clay or other impurities in their milk, the result of not following a proper method of working. The quantity of milk that flows from each cut varies; but if the tree is large, and has not been much tapped, the majority of the cups will be more than half full, and occasionally a few may be filled to the brim. But if the tree is much gnarled from tapping, whether it grows in the rich sludge of the *gapo* or dry land, many of the cups will be found to contain only about a tablespoonful of milk, and sometimes hardly that. On the following morning the operation is performed in the same way, only that the cuts or gashes beneath which the cups are placed, are made from 6 to 8 inches lower down the trunks than those of the previous day. Thus each day brings the cups gradually lower until the ground is reached. The collector then begins as high as he can reach, and descends as before, taking care, however, to make his cuts in separate places from those previously made. If the yield of milk from a tree is great, two rows of cups are put on at once, the one as high as can be reached, the other at the surface of the ground, and in the course of working, the upper row descending daily 6 or 8 inches, while the lower one ascends the same distance, both rows in a few days come together. When the produce of milk diminishes in long wrought trees, two or three cups are put on various parts of the trunk where the bark is thickest. Although many of the trees of this class are large, the supply of milk obtained is surprisingly little. This state of things is not the result of overtapping, as some have stated. Indeed, I do not believe it is possible to overtap a tree, if in the operation the wood is not left bare or injured. But at every stroke the collector's axe enters the wood, and the energies of the tree are required in forming new layers to cover those numerous wounds. The best milk-yielding tree I examined had the marks of twelve rows of cups which had already been put on this season. The rows were only 6

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inches apart, and in each row there were six cups, so that the total number of wood cuts within the space of three months amounted to seventy-two. It grew close to a *gapo* only 8 inches above high-tide mark, and being a vigorous tree, the cups were generally well filled, but with two years or so of such treatment, the tree would probably be permanently injured. It has been supposed that the quality of the milk is better in the dry season than during the rains. Such is the case with some vegetable products, but as regards indiarubber there ought not, I think, to be any appreciable difference. In the rainy season the milk probably contains a greater proportion of water; but, on the other hand, I am of opinion that then a larger quantity of milk flows from the tree. No doubt the dry season is the most suitable for caoutchouc collecting, although whenever a plantation is formed with a preparing house, convenient tapping may certainly be always carried on when the weather is fine. It is a common report that the trees yield the greatest quantity of milk at full moon. In order to ascertain this, a number of very careful experiments would have to be made, extending over one or two years. Even if such an assertion was found to be true, it would probably make little difference, as tapping will have to be carried on when circumstances are most favourable.

"There are two other methods adopted in tapping which are chiefly confined to the Upper Amazon and tributaries. Both are exactly on the same principle, the materials used being only a little different. The loose outside bark of the tree is cleaned off to a height of about 3 feet. Beneath, a gutter or raised border of clay is pasted or luted to the trunk, enclosing one-half of the entire circumference. Cuts are thickly made in the bark above this, from which the milk flows down to the gutter, whence it is conveyed to fall into a calabash, conveniently placed. The other mode is by binding round the trunk the stout flexible stem of a climber, and claying it round securely so that no milk might escape between the trunk and the climber. These plans are not extensively adopted, and can only be successfully put in practice where the trees have not been previously tapped. There is always a great deal of 'negrohead,' the result of the distance the milk has to run, and of the large quantity of clay employed in the process.

"*Collection of the milk.*—Going from tree to tree at a sort of running pace, the collector empties the contents of the cup into a large calabash which he carries in his hand. As he pours the milk out of each cup, he draws his thumb or fore-

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finger over the bottom to clean out some which otherwise would adhere. Indeed, a small quantity does remain, which is afterwards drawn off and classed as *sernamby*. The cups, on being emptied, are laid in a little heap at the base of each tree, to be ready for the following morning. The trees occur at various distances from 10 to 100 yards apart, and as I travelled over the intricate network of muddy footpaths, I continually felt perplexed and surprised that the natives have not yet seen the advantages which would be derived by forming plantations, whereby more than twice the quantity of caoutchouc might be collected in one-fourth of the time, and at far less cost and labour.

"*Method of preparing the rubber.*—The collectors of the region I visited, resorted with their milk to a large shed situated on the bank of the river Guamá. Here were quantities of various species of palm-nuts, representing an *Attalea* and *Euterpe edulis*, stored in heaps, and several jars for the preparation of rubber. These jars were 18 inches high, and the bottoms were broken out. At the base they were 7 inches in diameter, bulging out in the middle to 12 inches, and were narrowed at the mouth to a breadth of 2 inches. Each person wrought on his own account, and so small jars were employed, but where a number of men are collecting for one master, much larger jars are in use. The milk on being put into a large flat earthen vessel, is put down on the floor in a convenient place. Adjacent thereto the jar is set on three small stones, which raises it to 1½ inches above the floor. The narrow space between the base of the jar and the floor allows the air to enter, which causes a current of smoke to ascend with remarkable regularity and force. When the fire commences to burn strongly, several handfuls of nuts are put on, then some more wood and nuts alternately. These are dropped in at the mouth of the jar until it is filled to within 4 inches of the top. Due care is taken that a sufficient proportion of wood is put in with the nuts. The mould on which the rubber is prepared resembles the paddle of a canoe; in fact, in many places on the Amazon this is the article most frequently used if there is much milk, and when the rubber is prepared in bulky masses. Occasionally the mould is slung to the roof, as the weight of handling it during the process would otherwise be very fatiguing. A little soft clay is rubbed over it to prevent the rubber from adhering, and it is afterwards well warmed in the smoke. The operator holds the mould with one hand, while with the other he takes a small cup and pours two or three cups of milk over it. He

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turns it on edge for a few moments above the dish until the drops fall, then quickly places the flat side 2 inches above the jar mouth and moves it swiftly round, as if describing the form of a cipher with his hand, so that the current of smoke may be equally distributed. The opposite side of the mould is treated in the same way. The coating of milk on the mould on being held over the smoke immediately assumes a yellowish tinge, and although it appears to be firm when touched, is yet found to be soft and juicy, like newly-curdled cheese, and sweating water profusely. When layer after layer has been repeated, and the mass is of sufficient thickness, it is laid down on a board to solidify, and in the morning is cut open along the edge on one side and the mould taken out. Biscuit rubber, when fresh, is often 4 or 5 inches thick. On being hung up to dry for a few days, it is sent to market. When I saw the process of smoking the rubber performed, as just described, I was considering the statements of Keller and other travellers who write on this subject, all of whom seem to believe that the smoke from the palm-nuts possesses some peculiar or strange property by which means the milk instantly coagulates. But on one occasion, when the collector was commencing to smoke some milk, I saw him wait for a short time and put his hand repeatedly to the mouth of the jar, and soon I learned that he could do nothing until the smoke was hot. The dense white smoke rose abundantly, but the milk would not thicken on the mould. After a little while the jar became heated, and the operation went on quite satisfactorily. I put my hand above the mouth of the jar, but could bear the heat scarcely a second, and although the temperature of the smoke was apparently less than that of boiling water, yet I judged it must have been at least 180° Fahrenheit. Therefore the rapid coagulation of the milk is simply produced by the high temperature of the smoke. I have no doubt that with a strong current of heated air, or a good pressure of steam from a pipe, a similar result would be obtained. The finely-divided particles of soot, which forms a large proportion of the smoke, undoubtedly absorb a considerable amount of moisture, although at the same time it must be looked on as an impurity. I have no hesitation in giving my opinion that equally as good rubber could be prepared by putting the milk in shallow vessels, and evaporating the watery particles by the heat of boiling water.

"*Temperature of the Pará rubber district.*—The region of the Pará rubber tree has a sustained high temperature, a fact that has already been remarked by Dr. Spruce and other

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travellers. The lowest I could record was 73°, but Mr. Henderson assured me he had frequently seen it down to 72°, and I have the statement of another observer, on whom I could rely, that on one occasion the thermometer fell to 65°. The place, however, where this observation was made was fully 100 miles to the westward of Pará. In the neighbourhood rubber trees abounded.

"*Sites, propagation, and planting in India.*—The sites most suitable for planting this tree will be found in the hottest parts of India. The flat, low-lying, moist tracts, lands subject to inundation, shallow lagoons, water-holes, and all descriptions of mud accumulations, miry swamps, and banks of sluggish streams and rivers, will be found best adapted. The tree will also grow perfectly in deep, humid land, fitted for cane or coffee planting. The Malay peninsula, Burmah, the island of Ceylon, and the southern portion of India on to about as far north as 20° north latitude, should possess many localities proper.

"The temperature of rain-water varied from 74° to 75° for planting. But in no place would I recommend the formation of a plantation where the thermometer at any time falls below 60° Fahrenheit.

"It seems to me that the propagation and planting may generally be combined in one operation, the object being to reduce the expense, simplify and accelerate the work, and promote the more perfect development of the primary roots and trunk. The green-coloured terminal shoots of succulent growth, with the leaves fully matured, make the best cuttings. These should be cut off low enough so that there is a joint at the base. When it is desirable to plant in dry, firm land, a spadeful of soil should be turned over at each place, and the cutting planted in a sloping position. It should be covered with mould to within 3 inches of the point. That portion above ground should rest on the earth on one side to its termination, so as not to suffer during hot sunshine. In all stages the crowns of the plants may be exposed to the rays of the sun. Plants intended for cutting stocks may be planted in open places, in the richest dark loam capable of producing a luxuriant rank crop of sugar-cane. Seeds might be planted out permanently at once, also in the same way as the cuttings. These would prosper much better if, at the time of planting, a handful of wood-ashes were added to the soil with each seed. Good ashes may be obtained by the burning of any description of green wood or newly-felled piece of forest. If the wood is allowed to rot before burning,

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almost the whole of the fertilizing principle will be found to have vanished. If stored in a damp place, the value of the product is diminished. For planting on inundated lands, the period of high flood should be preferred. Cuttings of greater length would be required in this case, the lower ends of which should be sliced off in the form of a wedge. The workman could take a bundle of these, and wading into the water would plant at proper distances, but perfectly upright, taking care to push each cutting down deep enough in the soft muddy bottom, so that not more than three or four inches is above the surface of the water. The same rule would be applicable when planting in sludge or soft marsh land. The crowns of the cuttings must not, if possible, be put under water, as the young growths springing therefrom might rot. Seeds will not be found very applicable for planting in watery places or deep mud deposits. Some would come up, but a good many would mould and decay. In the varied course of circumstances and conditions, slight changes and modifications in the methods of working will no doubt suggest themselves. I would not advocate, at least for the present, the extensive planting of this tree in fertile, cane-producing lands, because in such a description of soil it would not be able to compete with the Central American rubber tree, already introduced from the State of Panama, which grows rapidly to a much greater size and yields a far larger quantity of caoutchouc. It should rather be planted in places where nothing else could be profitably cultivated, such as frequently inundated river margins, marsh land, and mud deposits. Above 4000 tons of Pará rubber are exported annually.

## "CEARÁ RUBBER.

"*Examination and collection of Seeds and Plants of Ceará Indiarubber.*—On the morning of the 26th, I went on shore, as I wished to gain some knowledge of the method adopted in preparation and collection of the rubber exported from Ceará. I had to land from the ship in a *jangada*, which is a craft 12 or 14 feet in length, formed of moderately-sized trunks of a tree fastened together, and furnished with a mast and large sail. A piece of board, a foot in breadth and 4 feet long, is pushed down in the middle between two logs, to serve as a keel. The tree selected for those rafts has a peculiarly light wood, said to be brought from Bahia or Pernambuco. With a good fair wind they are said to run



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sometimes at the rate of 15 knots an hour. The surf is so strong that no boat or canoe could often reach the shore safely. Even the *jangadas* are sometimes overturned, and when this happens there is a risk of getting a blow from the timbers of the raft, a danger considered greater than the sea. In the town I saw a large quantity of rubber in a merchant's store, and afterward observed that it was freely traded in by most classes of shopkeepers. I expected to have seen the tree yielding it somewhere near, but after travelling about over the sand-hills and adjoining country for the greater part of the day, I returned to the ship completely tired. I was assured by a native, who said he knew the Pará rubber tree and that of Ceará, that both were completely identical. But the great diversity in the climate induced me to think differently, and so I resolved to follow out the dictates of my own judgment, and not be influenced by any one until I could satisfy myself on the matter. Yet there was little time to explore, as the steamer was expected to leave in a very few days. Next morning an Indian from the interior happened to come on board the ship, and I took the opportunity of asking him the names of some of the villages and localities in the retired districts. I knew from previous travelling a good number of the Indian substantives with their meanings, and this, together with further conversation, enabled me to form some idea of the character of the region where the rubber was collected. A single line of rail, formed to facilitate the transport of sugar and cotton, runs from Ceará into the interior to a place called Pacatuba, distant about forty miles. Contiguous are a number of large plantations with some slaves. On Sunday, October 29, I landed with the *jangada*, and proceeded through the town to the railway-station. I had previously arranged with a native to accompany me, but he did not appear, so I went off alone. Leaving Ceará, a flat, parched-up region was traversed, diversified by a few undulations and moist hollows. Thorny thickets of bushes and slender trees, chiefly myrtles and legumes, overspread the country, with many groups of the carnauba palm, *Copernicia cerifera*, rising high above the ordinary vegetation. The crowns of these palm trees waved about by the wind and visible over such a wide expanse presented an appearance extremely picturesque, whilst in the distance beyond rose a multitude of conical peaks and mountains, the whole combining to form a landscape of surpassing beauty. After a journey of two hours, I stopped at a little village with about a dozen thatched houses, called Maracanahu. The distance

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may be thirty miles from Ceará. I went to a man and boy who were standing in front of a hut, and made some proposals to them to show me the locality where the rubber trees grew. The man was advising the boy to accompany me, who seemed rather reluctant, when a poor lad who had lost an arm came up and at once consented to go with me. It was fortunate I met with this one-armed lad, as I could hardly have succeeded so well with any one else. I told him I wanted first to see trees that were being wrought, because I wished to make sure of the tree, and also observe the method of collection. We proceeded along a dusty path for some distance, at times running, as I proposed, if possible, to return with the train which passed the village in the evening. Plantation establishments were seen dispersed at wide intervals over the country. Cultivation was only carried on in very low, moist situations, or where the water during the rains was stored up in artificial ponds for irrigation. Some of these were so large that at first I took them to be natural lakes. After travelling for some time the lad turned from the path and dived into the forest. In a few minutes he brought me among a number of rubber trees which had recently been bled. The general forest was tolerably high, but the sparse small foliage did not afford much shade from the fierce rays of the sun. The soil was in places a sort of soft sandstone or gravel, which was bound up in the most extraordinary manner. Neither grass nor weeds grew among the underwood, and there was an entire absence of ferns, mosses, and other plants. I soon saw that the tree was totally different from the rubber tree of Pará, and also that it would probably thrive perfectly over a very wide extent of the drier regions of India. At first sight it much resembles in appearance a birch tree, and the surface or epidermis of the bark comes off in the same way in thin silvery peelings. The largest of the trees were about 50 feet in height, with trunks 9 inches to a foot in diameter. The crown is divided into many branches, which grow in the form of a basket. The tree is deciduous, and there were neither leaves, flowers, nor fruit to be seen. I spent some time in examining attentively the process of bleeding the trees, and then commenced to search for plants. A few were found growing in an open space, but the roots were so firm that not one could be pulled up. It seemed strange that the lad and myself, exerting all our strength, could not pull up a young seedling plant about 2 feet high. I went and got a pointed branch of a hard-wood tree and scraped and dug about the roots, and in this way, with very arduous work, during which

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I hurt and lacerated my hands, some plants were got up. The real difficulty was now apparent. The roots of the plants were furnished with tubers, the largest of which were about the size of kidney potatoes. These tubers, although quite near the surface, adhered with such tenacity to the sandstone, or hard gravel, that most of them had to be smashed in order to get away an uninjured portion of root with the stem. In the young state they are soft and spongy, and are seen to contain milk, but afterwards become lengthened out and form a part of the root. With diligent search and hard labour we succeeded in collecting eighteen plants. At the station a number of natives from Ceará gathered round the 'bundle of sticks,' but could not make out what they were. However, an old man from the forest district came up, and, peering through the crowd, said, 'Manisoba.' This is the Indian name of the rubber tree, which I knew before. I got back to Ceará just before dark, and fortunately found a *jangada*, which put me on board. Thus in one day I was fortunately able to discover the origin of a tree, hitherto unknown and undescribed, yielding an important article of commerce, and at the same time resolved the mode of collection and preparation and secured a number of plants. It is true I had no instructions regarding this Ceará rubber plant, probably because it was supposed to be the same as the Pará tree. But I thought it would be well to secure more plants, and told the owner of the *jangada* to come for me in the morning. This sort of raft was expensive, each voyage cost me three milreis (6*s.*), and I could not possibly have got one for less. The distance was only about 300 yards. Next day the sea was very rough, and three *jangadas*, one of which carried the Brazilian Government mails, were overturned in the surf. The person I arranged with came for me, and I embarked. Although I was not in the least alarmed, the size and violence of the waves completely surprised me, whilst the *jangada* at full speed went groaning through the surf, covered by 9 inches or a foot of water. I cannot help wondering that not a farthing has been spent in improving the safety of these Brazilian ports.

"Returning to Maracanahu, I proceeded to an adjacent house, where I was previously told I could stay. The son of the owner assisted me in obtaining a quantity of seeds, 700 in all. The pods when ripe burst and go to pieces, and so the seeds are showered on the ground. At daybreak next day we went in search of plants. We brought a strong iron hoe, as my intentions were to take up a good number, for I

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did not place much confidence in the seeds, although I am glad to state they have turned out well. Our course was directed to a more distant part than I had previously visited. Shortly after entering the bush-like forest we came on a large tract of land covered by immense masses of grey granite, some of which might be 50 tons or more in weight. These had been broken where they lay, and were the result of a volcanic explosion. Rounded masses of the same rock also cropped out in many places. Travelling now became very difficult, as we had occasionally to scramble from one block to another on our hands and knees. Many good-sized rubber trees were growing in the spaces between those granite masses, but no plants were seen. The situation was very dry, but no doubt some seedlings had sprung up, which, owing to numerous thickets of shrubs, were not perceived. After fully an hour of tiresome exploring, I resolved to go back to the place where I got plants previously. We there succeeded in collecting a number, which, with those formerly gathered, amounted in all to sixty. The handle of the hoe broke, for which reason the work was not further prosecuted. Taking with me the seeds and plants, I returned to the steamer in the afternoon.

"*System practised in Bleeding or Tapping the Trees, and collecting the Rubber.*—This is an operation of a very simple description. On commencing to work the collector takes with him a stout knife, and a handful of twigs to serve as a broom. Arriving at a tree, any loose stones or dust are swept from the ground around the base, and some large leaves are laid down to receive the droppings of milk which trickle down. Some do not go to the trouble of sweeping the ground or laying down leaves, for which reason the milk adheres to sand, dust, decayed leaves, and other impurities. The outer surface of the bark of the trunk is pared or sliced off to a height of 4 or 5 feet. The milk then exudes and runs down in many tortuous courses, some of it ultimately falling on the ground. After several days the juice becomes dry and solid, and is then pulled off in strings and rolled up in balls, or put into bags in loose masses; only a thin paring should be taken off just deep enough to reach the milk vessels; but this is not always attended to. Nearly every tree has been cut through the bark, and a slice taken off the wood. Decay then proceeds rapidly, and many of the trunks are hollow. In this condition the tree must yield far less milk, and many, no doubt, are broken over by the wind or wither away. Collecting is carried on in the dry season only, when rain seldom falls.

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"*Climate and Temperature.*—The flat country from Ceará, running back to the mountains, in which the tree abounds, manifestly possesses a very dry, arid climate for a considerable part of the year. This is evident from the fact that *mandioca* (cassava) and other crops require to be irrigated. The rainy season is said to begin in November, and end in May or June. Torrents of rain are then reported to fall for several days in succession, after which the weather moderates for a brief space. According to some statements, there are occasional years when hardly any rain falls. This assertion concurs with the aspect presented by the country in general. The daily temperature on board the ship varied from 82° to 85° Fahrenheit, but inland it is often probably 90°.

"The localities traversed by me nowhere seemed to be elevated more than 200 feet above the sea. The situations selected for cultivation in India should possess a rather dry and sustained high temperature. In the comparatively low-lying coast country of the southern portion of the peninsula of India, including the districts of Madras, Cochin, Calicut, Cannanore, Mangalore, and Bombay, will be found many localities possessing all the conditions essential for the growth of Ceará rubber. The plant might likewise be tried in the deep tropical valleys of Assam, and, indeed, in all the parched regions of India within the limits of coffee planting. It may not be safe, at least until some experience is gained, to plant in any locality where the temperature at any time of the year falls below 50° Fahrenheit.

"*Propagation and Planting.*—Seeds are early produced if the tree is not shaded. They should be buried in brown sand, kept pretty moist until there are indications of growth, when they may be planted out permanently. In some situations where the ground is rough and strong, they might be sown broadcast. Meantime, I would suggest the formation of plantations by cuttings, which will take place as easily as a willow. These should be taken from the points of strong shoots, and may be one foot in length. In planting, each cutting may be put down in the soil to a depth of 6 inches. If scarce, the entire shoot may be cut into pieces, each possessing a bud, all of which will grow, if covered with half-an-inch or so of soil. On loose sandy soils, or exhausted coffee lands, plantations may be formed at little expense. Dry, hard, gravelly wastes, if found to support any kind of bush, are also suitable sites. Holes might be made in strong lands with an iron jumper, and a stout cutting put into each, and filled with pebbles. On bare and thinly-covered rocks

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the cuttings might be laid down flat, and a little heap of stones or any kind of *débris* about the size of a mole-hill piled on each, care being taken that the extreme point of each cutting with a bud is left uncovered. I do not advocate planting in an entirely barren desert, but wherever there is any kind of stunted tree or scrub vegetation, with an occasional sprinkling from a monsoon shower, the tree is likely to prosper. Ceará rubber occupies a good position in the market. The export has been stated to amount to 1000 tons per annum.

"*Specimens of Indiarubber.*—I have forwarded to Mr. Markham the following specimens of caoutchouc No. 1, prepared as follows—An imperial pint of rubber-milk was put into a tin can previously blackened, and exposed for fully two hours to the sun during the hottest part of the day. The lid of the can was put down close. The temperature obtained exceeded 120°, but only about half the milk coagulated. The mass was pressed, when a whey-like juice came from it freely. It was then put to dry. No. 2 formed the remaining portion of the milk. It was put in a shallow tin vessel, and evaporated at 212°. Every drop of the milk coagulated. The entire produce of the pint was found to weigh 10 ounces. This yield exceeds any calculation I have seen on the subject, but I did everything correctly. In the process followed with No. 1, it was probably the richest portion of the milk that thickened, as may happen in the same way with various principles obtained from vegetable structure.

"Nos. 3 and 4 comprise a 'biscuit' and half a biscuit of rubber, prepared by the smoking process, as already described. These and the previous preparations are from trees, whence the plants were obtained yielding the white variety. It abounds chiefly in the lower districts of the Amazon valley.

"No. 5. A choice sample of seasoned rubber, kindly selected for me by her Britannic Majesty's Consul, Mr. Green.

"No. 6. This is a black sort of rubber, and in appearance agrees perfectly with a species described by Dr. Spruce, which he saw wrought on a tributary of the Upper Amazon. Some Pará merchants say it is not so elastic as the white variety.

"No. 7. The best kind of 'negrohead,' or *sernamby*, resulting from detached portions, and dropping during the smoking operations.

"No. 8. 'Negrohead,' or *sernamby*, being the gatherings from tapping cups.

"No. 9. A small piece of Pará rubber, prepared by the German method with alum. A few grains of finely-powdered

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alum were thrown into a little milk and stirred, when it coagulated in less than a minute.

"No. 10. 'Mangaba' rubber, obtained from a shrub (*Hancornia* species) growing along the southern coast of Brazil. German merchants have taught the natives to prepare it with alum,—it brings a low price in the market.

"No. 11. Ceará rubber of commerce, now being introduced into India.

"*Observations relating to the Rubber-producing Tree of Central America.*—I will now add a few remarks concerning this tree, which I collected in the interior of the Isthmus of Panama towards the latter end of 1875. This, because I think it has not received the attention it deserves. There are now a good collection of plants at Kew, and I am surprised that more have not been sent to India.

"The tree inhabits wooded regions near Guayaquil and Buenaventura, and has likewise been met with abundantly in the State of Panama, and in the Republics of Costa Rica, Nicaragua, Honduras, Guatemala, and Mexico. It is one of the largest and most massive of the trees of western tropical America. The trunk often attains to a surprising thickness and height, yielding in some instances above a hundred pounds of indiarubber. The wood is extremely soft, and when cut into, decays rapidly. The destructive method of cutting down the tree to be tapped, has exhausted extensive rubber localities, and although others may be opened up, yet the supply is certain to diminish at no distant date. Even where the trees are not felled, as in Nicaragua, the method of tapping, by which the wood is injured, is so unskilful, that it has been considered by some as preferable to cut the tree down at once. The climate of various of these districts is hostile and severe, and some places, such as the forest regions of Buenaventura and Choco, have no parallel in the universe. Throughout the State of Panama, drenching rains are of almost daily occurrence, and occasionally, on the Atlantic side, hurricane blasts make avenues in the forest.

"The district investigated by me, and where the plants were collected, was reached by ascending for some distance the river Chagres, and then travelling for several miles through a stately forest, into the heart of the isthmus. The trees seen exceeded in height and dimensions those met with in the wooded districts of the Amazon. An undergrowth of a thorny wild pineapple (*Bromelia*), 10 feet in height, everywhere formed extensive thickets. Large powerful snakes were numerous, and so audacious that they deliberately rose to strike at any

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one who approached. The young rubber saplings were found growing most abundantly on the banks of cool, clear, running streams and little dribbling rivulets. The roots could easily be traced over the surface of the ground running down to the very surface of the water. But the tree grew also on eminences, steep declivities, and varied elevations, and in such abundance that the first explorers gave the name of 'Caoutchouc Hill' to a height which they found crowned with a forest almost entirely composed of rubber trees. It was not seen growing anywhere in swamp or marsh land. Although the rubber districts are proverbially rainy, yet the tree was seen by me growing beside a stream on the border of a desert tract of country bounding the Gulf of Guayaquil, where only a few light showers of rain fell during the year. On both sides of the stream there was a strip of good forest, but beyond, thickets of *cacteæ* and low spreading legumes formed the characteristic vegetation. I mention the fact to show that the tree will probably succeed well in regularly irrigated districts, even if the atmosphere be dry and dusty. The temperature in the woods of the isthmus ranged from 75° to 88° Fahrenheit. Rain-water, examined the moment it fell, was never found to be below 74°. The usual practice in collecting the milk was by felling the tree, and then making deep notches around the trunk at distances not exceeding one foot apart. Broad leaves were placed beneath these, to receive the milk, which afterwards was collected in a large calabash or other vessel. A hole was then dug in the ground, and the milk poured into it and thatched over with leaves. It coagulated in about two weeks. Another method was to bruise a handful of the large, broad, heart-shaped leaves of a climber, a species of *Ipomea*, and stir these about in the milk. By this operation the milk thickened in less than an hour, having the appearance of a jelly-like mass, but very porous, and exuding profusely a black ink-like water, whenever touched or moved. This system of preparation produces an inferior article, and I have seen some buyers from the United States cut up the large juicy flakes into slices an inch or so in thickness, and dry them in the sun. The temperature of the sea-water along the west coast where the rubber tree grows, is high, and does not vary much during the year. In the Gulf of Guayaquil it is usually 78°, at Buenaventura 80°, and in the Bay of Panama 79°. The water of the river Chagres, although 80° in fine weather, falls during violent rains to 76°. On such occasions, many fish are to be seen in certain places floating about in the water as if benumbed or dying. I do not know if this is the result of

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the sudden lowering of the temperature, or if it is to be attributed to the great quantity of decayed vegetable matter, brought down by the discoloured swollen torrents from the interior of the forest.

"In India there are many districts which possess all the climatic conditions necessary for the successful cultivation of Central American rubber. From Bombay southward, the majority of the deep debouches of the Ghats coming from the base of the western slope of the Malabar hills, including the humid forest region extending in places down towards the coast, contain many excellent sites. In Ceylon and Southern Burmah and the Malay Peninsula, the tree is likely to thrive in all proper situations. Calicut is about the same latitude as the centre of the region occupied by this rubber tree in its wild state. The deep recesses of the Sispara Ghat really closely resemble some of the caoutchouc districts adjoining the river Dagua. The sites selected ought to be at low elevations, and no place should be tried where the temperature at any time during the year falls below 60° Fahrenheit. Marsh-land must be avoided. In dry desert localities, the tree may be expected to do well when planted along the banks of canals, or any description of channels where water is flowing for a whole or a portion of the day. Trees in good situations will produce seeds early, but these will require to be planted without delay, as drying destroys their vitality. But cuttings must be resorted to first, and stout branches, cut into pieces each possessing a bud, and covered lightly with soil, will generally be found to grow. Strong cuttings a foot in length and furnished with buds, when planted in the usual way, will become strong plants sooner. However, the propagation of this tree will not be found so easy as that of the Ceará rubber.

"In the planting out of young plants, the petiole or leaf-stalk of the lowest or oldest leaf should be buried in the soil. By following this simple rule, the plant commences to grow at once, its growth is vigorous and the trunk symmetrical. But if, at the period of planting, there is much bare stem above ground, then growth is usually slow, the plant remains 'leggy' for some time afterwards, and never makes a good tree. If the plants get a little attention until they are 4 or 5 feet in height, I do not think there is any description of weeds or forest growth in India that will afterwards overtop them. The rapid growth of this tree, by which a large amount of vegetable mould is added to the soil, is an important feature. My own opinion is that, if planted in suitable places

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and properly wrought, it will be found to yield a larger return per acre than any other plant or tree cultivated in India.

"*Concluding Remarks.*—In commencing the cultivation of these trees in India, it may be well to ascertain by actual experiment, as early as possible, the species likely to yield the largest amount of caoutchouc. It is possible that, as regards quality, there may be little, if any, difference in the milk of the various kinds when collected and prepared in the same way.

"As has been already stated, each of the three sorts require rather different sites, a wet or swampy situation being most natural to the *Pará* tree, while the moist banks of rippling streams or rivulets will be found well suited for the species from Panama. The *Ceará* tree is not delicate, and will grow and produce rubber in situations where other kinds, if planted, would be dried up. For these reasons, it is likely to prove a valuable plant in India, in parched-up regions and stony unproductive lands thinly covered with soil. The cup method, if employed in an extended way, may be found a convenient mode of tapping. Thus twenty rows of cups distributed over the entire trunk might be put on at one time. The earth could also be cleared away from underneath the large roots to allow of their being properly tapped. Even by the rude method adopted in South America, by which the wood is much hacked, the roots are found to yield milk abundantly at all seasons of excellent quality. But whatever method is adopted, it is very evident that if care is exercised, tapping may be carried on continually. The Pará tree in many localities gets no rest, except during a very wet moon, or when the collectors are drinking *cachass*. Therefore, the idea of giving the trees one or two years' rest ought not to be entertained. The Ceará method of paring off the surface of the bark might be tried on any of the sorts in dry weather. *Pará* and *Panama* trees may be tapped on attaining a diameter of say 6 to 8 inches, and that of *Ceará* with a diameter of 4 to 5 inches. A collector in a plantation working with cups should be able to collect easily from 8 to 10 lbs. of rubber per day. On the Amazon, in newly-opened districts, where the trees have not been operated on before, practised hands are sometimes able to collect from 20 to 30 lbs. daily. A much greater quantity may be collected in even a shorter time on the Isthmus of Panama and adjacent regions, but then the trees are cut down to obtain the milk, a plan which it is assumed will not be followed in India. The cup process

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of tapping, the most general in use in the Amazon valley, is an Indian method, and is said to have been in use among them at the time America was discovered.

"No time should be lost in reducing the milk, when collected, to a solid state, for if this matter is delayed, decomposition takes place, which furnishes much of the impurity complained of by manufacturers. If possible, the milk should be coagulated on the day it is collected. The milk of some species, such as that of the *Panama* rubber tree, may keep for a week or more in a cool shady place, but *Pará* rubber-milk spoils within the space of twenty hours, and gives off a most disagreeable odour. All the *Pará* rubber is prepared by the method I have described. Where nuts cannot easily be found, green foliage is used instead. The 'fumes of sulphur,' 'acetic acid,' or 'ammonia' are never employed. Alum is generally used in thickening the *mangaba* milk in the south of Brazil, but it appears to destroy the elasticity of the rubber. The watery portion may be evaporated by placing the milk, in small quantities at a time, in shallow vessels, attached to any simple form of hot-water apparatus. Either this or the adoption of a smoking apparatus similar to that of *Pará* will probably be found the best. The material should be prepared in thin flakes about 1½ inches in thickness. These pieces, if made square in the form of a bale, could be fastened together and covered with soft cloth. In this way rubber would be easily handled and stowed.

"The milk of *Messeranduba* (*Lucuma procera*), and of one or two milk-yielding trees of the Amazon districts reported to be mixed frequently with Pará rubber, possesses no elasticity when prepared separately.

"The island of Borneo has been suggested to me as a place specially suited for the formation of indiarubber plantations. No doubt they would grow there as well as in India, but probably not any better. Although the position in point of latitude may appear in favour of Borneo as regards the *Pará* tree, I doubt if the climatic conditions of that island excel in any particular the southern portion of the Madras Presidency at low elevations. It must be remembered that what is termed by some 'the equator of heat' is considerably to the north of our geographical equator. On the American continent it may be placed, I think, at not less than ten degrees of north latitude. In the dense forest regions of the Amazon and Panama Isthmus, the most striking feature is the extraordinary development of certain trees, occupying large spaces of ground, chiefly *ficus* and *bombax*, mantled by a dense pro-

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fusion of leafy climbers, the trunks and branches clothed with parasitical plants. In India, as for instance in the best forest portions of the Sispara Ghat, there are no conspicuous large trees with buttressed roots, but there is a far more even development of general forest trees, and I have no doubt if an acre of such land was cleared, and the wood thereof weighed, it would be found to equal, if not exceed, the product of a similar extent of ground in the wooded districts of tropical America. Apart from this, however, there remains a more positive proof of the capabilities possessed by the climate of Southern India. The coco-nut and mango trees can only be cultivated in the hottest regions of the tropics. Now I have visited places where these trees were planted by the natives, such as Jamaica, Hayti, St. Domingo, Porto Rico, Santa Martha, Carthagena, Panama, Buenaventura, Jumaco, Bahia, Esmeralda, Guayaquil, and Pará, but nowhere was the fruit superior nor hardly so large as the mangoes and coco-nuts of the Malabar coast. For these and other reasons, I have confidence that there exist the necessary conditions for the successful cultivation of the American rubber-yielding trees in many parts of India.

* * * * * *

"In conclusion, I trust the way in which I have performed these services may be considered satisfactory.

"I am, Sir, your most obedient servant,

"ROBERT CROSS."

*The American Indiarubber trees in Southern India.*[1]

"TO THE CONSERVATOR OF FORESTS, MADRAS.

"*Ootacamund, March* 6, 1881.

"SIR,

"Respecting my previously arranged journey to visit the sites proposed for the cultivation of the various species of American indiarubber trees, I beg to state that I proceeded on this duty on February 15, and arrived at the bungalow at Nilambur on the evening of the 17th. The course pursued was by Naduvatam, Gudalur, and Nadgame, descending afterwards by the Carcoor Ghat to the plain land below.

"On the following day, accompanied by Mr. Ferguson and Mr. Hadfield, his successor, I visited the site of the newly-

[1] Reprinted by permission of the Secretary of State for India.

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introduced rubber plants. These have been planted in an open space of teak forest land on the bank of the Nilambur river.

"The first sort examined was that which furnished the rubber known in the market as 'Ceará scrap.' The tree belongs to the Mandioca family, and the roots are furnished usually with tubers, which vary in size and number in accordance with its growth. The plants of this sort have, in the brief space of two years, shot up in the most surprising manner, the highest upwards of 30 feet in height, and are now yielding an abundant crop of seeds. I was shown one strong rank sapling, which, in five months from the time of planting, had grown up and produced flower.

"This region is, without doubt, admirably adapted for the growth of the tree; and the robust and vigorous appearance of those already planted is certainly quite equal to any trees of the same apparent age and size I saw when engaged in collecting the original plants near Ceará on the coast of Brazil. At the same time, I would confine the general planting of the Ceará rubber to rather dry, arid situations and poor soils, reserving the good, deep, moist sandy loam of the Nilambur river and its tributaries for the Castilloa.

"Mr. Ferguson was desirous of proof for the actual existence of rubber in his Ceará saplings; and although these were too young to yield this product, I resolved to make an attempt to satisfy him. The natives at Ceará, in bleeding this sort, simply slice off the outer portion of the bark on one side of the tree from the base to a height of 4 or 5 feet. The milk exudes from the pared portions of the trunk and runs down in little courses. By the following morning the milky juice of these courses is sufficiently solidified to be pulled from the tree in strings, which are rolled up into balls, as the work of collection proceeds.

"When this process was tried on one tree the milk exuded freely, but next day, on examination, it was found that the greater portion had evaporated, showing the watery and immature state in which the milk exists in young growing plants. However, on making incisions on the collar and largest roots of the plants, milk of good quality was obtained, which next day was found coagulated. From the collar of five saplings about an ounce of rubber was obtained, which, in appearance, elasticity, and odour, could not have been distinguished from 'Ceará scrap' as seen in commerce. But it is manifest the trees ought to be allowed to attain some size before being wrought.

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"The propagation of this sort is as easy as a willow. I made a few cuttings just to show the proper method, and these were planted near the bungalow. But now that the trees were producing seeds, recourse to cuttings may not often be necessary. Each seed before sowing should have a small portion of the outer shell broken off by a pair of pincers,[1] simply to allow the moisture to reach the embryo, which in the operation should not be injured ; or by merely burying the seeds in moist sand germination will take place much earlier.

"*The Pará Rubber.*—This rubber tree, which yields a valuable commercial product, has seemingly not found its proper habitat at Nilambur. The young plants have shot up like long whip-handles with a bunch of leaves on the top. There is not, however, the slightest reason to despair of success. Some plants, say a dozen, should be planted in the Carcoor Ghat at an elevation of 1000 feet, and another dozen might be put down at 2000 feet, or, for example, somewhere in the vicinity of 'Campbell's Rock.' A little clear site at each place, a few yards in extent, and easily reached from the road, would suffice for these experiments. The Pará tree is easily multiplied, and recourse may be had to the same way as that adopted for willows. I made some cuttings, which were planted in a moist situation on the river-bank. From these it may be seen whether additional humidity improves the character of the plant.

"*Central American Rubber.*—The *Castilloa elastica*, yielding this description of rubber, and of which there are only three plants, has evidently found a home on the bank of the Nilambur river. It may be considered premature to judge or form an opinion from the appearance of only three plants, from 3 to 4 feet in height, and indeed this is so. But besides having looked carefully and attentively at the physical appearance and development of these plants, I have considered and remembered the characteristics of the extensive region inhabited by this tree. The *Castilloa* is found growing throughout the Central American Republics always at low elevations, and certainly I do not think I noticed it anywhere above an elevation of 2000 feet. North of the Equator, it is met with in the wooded districts, which bound Jembico in Mexico, extending southward through the dense exuberant forest regions of the Central American Republics, and stretching across from the Atlantic to the Pacific, on as far as

[1] Or rasping off with a file the two edges at the radicular end, recognized by a flat two-lobed appendage; it is advisable not to file off the actual end for fear of injury to the embryo.—W. W. A. F.G.

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the river Atrato, after which it is confined to the forests and base of the mountain ravines bordering on the Pacific coast, and thus continues to Santa Rosa and Arenillas near Tumbez districts, which lie adjacent to the Peruvian desert. Throughout this vast expanse of country there is, without doubt, considerable variation of climate. But it so happens that the periods representing the wet and dry seasons coincide in a remarkable manner, at least as far as I can learn, with the occurrence of the same periods on the Western Ghats. In the region of the *Castilloa*, especially on the Pacific side, the dry season sets in about the beginning of January, and continues until April. During this time the rank swamp growth is occasionally so dry that it is set on fire and burned. In the dry season the tree becomes deciduous, and in March pushes forth a fig-shaped fruit, which ripens with a beautiful scarlet crown, all the rest remaining green. In August the fruit is ripe during the heavy rains. The seeds cannot be dried, and must be planted as soon as the fruit falls. It is not found growing on swamps or inundated land, but on the flat moist banks of rivers and steep sides of ravines where the roots may be seen running down the banks, for a distance of 15 or 20 feet, to the very margin of the streams.

"The *Castilloa* is the largest known rubber-producing tree, its massive trunk sometimes rising in close humid spots to a height of 80 feet clear of branches, and is only exceeded by the 'Quipo,' a gigantic species of *Bombax*. Sometimes the trunk divides into two stems, evidently from the leading bud having been broken when young, and those trees are less prized by the rubber-collectors. In order to extract the milk, the usual course is to cut the tree down, and make notches round the trunk at about a foot apart. Broad leaves or calabashes are then placed underneath these into which the milk drops. In a few localities, especially at Nicaragua, the trees are not felled. The practice is to make a perpendicular channel in the bark from the base of the trunk upwards, and then make a number of cuts on each side leading into the main channel. A good deal of milk always adheres and solidifies in the primary and side channels, which is afterwards collected. These 'dregs' are much valued in the markets of the United States. I have heard it argued among the natives that it was probably more profitable to cut the tree down than trust to the bleeding channel process. My own opinion is, that the channel method is good, specially for the *Castilloa*, but the collectors gash the trees so badly in working that the after flow of milk is much lessened. Besides, at the base of the

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main channel, they drive an iron spout into the trunk in order to convey the milk from the tree to the calabash. A piece of bamboo, luted by means of clay to the base of the channel, would serve the same purpose just as well, whilst the wood of the tree would escape permanent injury. In combination with the channel process, collecting by the cup method will often be found useful, especially in the case of large trees, as cups can be applied to various parts of the tree, which, if operated on by channels, would result in the loss of much milk. I have described the cup process in my report to the India Office on the collecting of *Pará* rubber plants, with date of 1877. Respecting the quantity of rubber which may be obtained from a tree, the amount would depend on the age and size of the tree, season, habitat, and likewise mode of collecting.

"During the rainy season the flow of milk is greater, and this also is the case with the trees growing in humid localities. The skill and care of the collector must also be taken into account; some spill and waste a great deal of milk.

"A *Castilloa* tree with a diameter of 1½ to 2 feet, if carefully and judiciously tapped, may be expected to yield about twelve pounds of rubber per annum.

"Of all the different species of rubber-producing trees, the *Castilloa* should prove under cultivation the most remunerative. The banks of the Nilambur river and its tributaries afford, in my opinion, suitable sites for planting, and I have no hesitation in stating that the lower portions of the Carcoor Ghat would grow and sustain as fine *Castilloa* trees as any district of Central or South America. The conditions of the bottom and deep side ravines of the Carcoor Ghat are of the most superb description. But no doubt many excellent sites exist along the course of the Western Ghat southwards towards Sispara, and likewise to the northward in the Nagar region. In planting, the ground should be cleared so that the trees may grow up robust, but there will be little 'mamatie' work; for, once the *Castilloa* gets up it will overtop the majority of the Ghat trees.

"The propagation of this sort from a limited stock will require more skill than would be necessary for multiplying the *Ceará* or *Pará* rubbers.

"As yet, that plant at Nilambur presents few materials for propagation, though, as the growth of the tree is rapid, a supply of cutting shoots will probably be available after the burst of the monsoon. By erecting a small platform, we were able to lay a branch with seven shoots, so that when these are rooted the



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stock will be at once fully doubled. I would certainly advocate the multiplication of cuttings of the *Castilloa*, as it is not an early seeder. In America the trees do not usually bear seed until they are about eight years old. Before the lapse of such a period, thousands of *Castilloa* plants might be growing up into young trees at Nilambur, derived by means of propagation. I regret to state that time did not permit me to visit the Silent Valley as a special site for the *Castilloa*. I have no doubt, however, that it will be found well suited for the growth of the tree.

"I returned to this place on February 25.

"In conclusion, I trust the way in which this duty has been performed will meet with approval.

"I am, Sir,

"Your most obedient servant,

"ROBERT CROSS."

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# APPENDIX E

## EXTRACTS RELATING TO FIBRE-PLANTS

### BOWSTRING HEMP.[1]

THIS at present is not an article in commercial use; but attention may well be directed to the capabilities of numerous species of *Sansevieria* for producing fibre of great value. Plants of *Sansevieria*, of which there are ten or twelve species, are very abundant on both the east and west coasts of Tropical Africa, which indeed may be looked upon as the head-quarters of the genus. One well-known species (*S. zeylanica*) is indigenous to Ceylon; and this and others are found along the Bay of Bengal, extending thence to Java and to the coasts of China. The leaves of these plants are more or less succulent, and abound in a very valuable fibre, remarkable alike for fineness, elasticity, and for strength.

Usually the leaves are not more than 1½ to 2 feet long; in some species, such as *S. guineensis* and *S. cylindrica*, the leaves attain a length of 3 or 4 feet; while in one species, native of Tropical Africa, the leaves under favourable circumstances attain a length of 9 feet. In this species, for particulars of which and for samples of its fibre we are indebted to Sir John Kirk, G.C.M.G., Consul-General at Zanzibar, the quality of the fibre is exceptionally good. We have doubtless here a new fibre of great value.[2]

[1] Reprinted by special permission of the Controller of her Majesty's Stationery Office. (From Royal Gardens, *Kew Bulletin of Miscellaneous Information*, No. 5, May 1897.)

[2] As to the identification of this plant, Mr. Baker remarks as follows—"We have a specimen in flower from Buchanan, 'Shire highlands, Zambesia. Yields a most excellent fibre.' So far as can be judged by a rough sketch, Sir John Kirk's is the same plant; and there seems no reason why it should not be identical with *S. longiflora*, Sims, in *Bot. Mag.* t. 2634, of which we have specimens from Guinea, Angola, etc."



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In the treatment of the leaves of *Sansevieria* by machinery, the great drawback hitherto experienced has been their comparatively small size, and the difficulty of cleaning the fibre contained in them in an expeditious and remunerative manner. These circumstances would not obtain in the case of the plant

BOWSTRING HEMP.[1]
*Sansevieria zeylanica*, Willd.
*a*. Flower laid open. *b*. Seeds.

brought into notice by Sir John Kirk. Indeed, for moist, tropical climates, as opposed to the dry, hot, and arid districts of Yucatan, where the Sisal hemp is grown, this and *S. longiflora*, if they are really distinct, would be likely to prove of exceptional value as fibre-plants.

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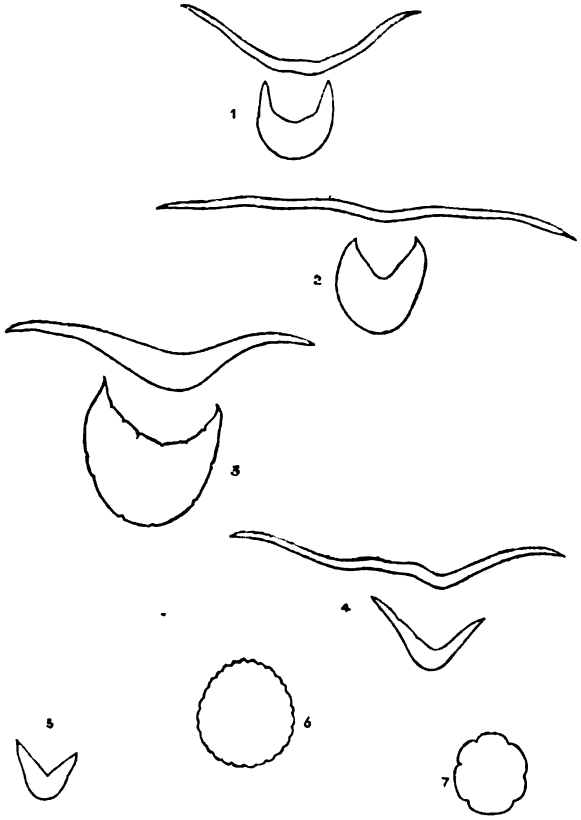
It may be mentioned that all species of *Sansevieria* prefer a rich, moist soil and a comparatively humid climate. They are essentially tropical plants, and do not thrive in a tempera-




SECTIONS OF LEAVES OF SPECIES OF *SANSEVIERIA*—

1. *S. guineensis.*
2. *S. longiflora.*
3. *S. Kirkii.*
4. *S. thyrsiflora.*
5. *S. zeylanica.*
6. *S. cylindrica.*
7. *S. sulcata.*

NOTE.—Where, as in Nos. 1, 2, 3, 4, two sections are given, the lower is from the base of the leaf, and the other exactly across the middle or widest part of the leaf. The sections here represented are nearly the natural size of leaves grown under cultivation at Kew. In the tropics under suitable conditions all the leaves would necessarily grow to a much larger size.

ture less than 60° Fahr. Under such conditions they grow rapidly, and establish themselves permanently by means of large, spreading, fleshy rhizomes or underground stems. It is true they will grow in comparatively dry districts, and even

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in soils strongly impregnated with salt; but their growth under such circumstances is very slow, and the leaves are seldom large enough to produce marketable fibre.

Dr. Roxburgh proposed that the fibres of *Sansevierias* might be called *bowstring hemp*, because the natives of the Circars make their best bowstrings of them. On the other hand, small samples of fibre from *S. guineensis*, which have appeared in the London market, have been called African bowstring hemp. These fibres are very firm, hair-like and silky, and closely resemble those of the pineapple; they are said to take dyes very readily; and the tow is mentioned by Royle to have been converted into good paper at Trichinopoly.

Plants of *Sansevieria* are already abundant in a wild or semi-cultivated state in most tropical countries. They are capable of being propagated very readily. Usually the underground stem or rhizome is divided and planted; but plants may also be raised from seed, or from the leaves, which latter, planted whole or cut into small pieces, readily take root in moist situations.

A full botanical description of the several species of Sansevieria may be found in a monograph of the ASPARAGACEÆ, in the fourteenth volume of the *Journal of the Linnean Society*, pp. 546-550, by Mr. J. G. Baker, F.R.S. The descriptions given in the following notes are contributed by Mr. Baker. The species are restricted to those which are now under cultivation at Kew, and of which specimens of fibre have been prepared and examined. The plants may be seen in the west transept of the palm-house at Kew; while the specimens of fibres are in Kew Museum, No. 2.

The species, or well-marked sub-species of *Sansevieria*,[1] of which we have living plants at Kew, are seven in number, and they may be readily classified according to their leaves in three groups, as follows—

I. Leaves comparatively thin and flat—

1. *S. guineensis.*
2. *S. longiflora.*
3. *S. Kirkii.*
4. *S. thyrsiflora.*

II. Leaves semicircular in transverse section at the middle, deeply hollowed down the face—

5. *S. zeylanica.*

[1] As regards the spelling, following the *Genera Plantarum*, we have adopted *Sansevieria*, instead of *Sanseviera*, as being the oldest name. Thunberg had it *Sansevieria*; Willdenow altered it to *Sanseviera*, and Kunth followed. Bentham in *Genera Plantarum* reverted to *Sansevieria*.

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III. Leaves club-shaped, more like stems than proper leaves.

6. *S. cylindrica.* 7. *S. sulcata.*

1. SANSEVIERIA GUINEENSIS, Willd., is one of the two oldest and best known species. It was first figured and described, long before the days of Linnæus, in the year 1701, by Commelinus, in his *Horti Medici Amstelodamensis Rariorum Plantarum Descriptio* (tab. 20), under the name of "Aloe guineensis radice geniculata foliis ex viridi et atro undulatim variegatis." Linnæus classified it under the genus *Aletris*, and so did Jacquin, who figured and carefully described it in 1770, in his *Hortus Vindobonensis*, vol. i. p. 67, t. 84. It has horny, erect, lanceolate leaves, 3 or 4 feet long, 3 inches broad at the middle, narrowed gradually to an acute apex, not distinctly bordered with red, copiously mottled on both surfaces with broad, irregular bands of white. The flowers are in a lax, simple spike, which rises to the same height as the leaves, in clusters of three to six, with a whitish perianth about 2 inches long, of which the six segments are about as long as the cylindrical tube. It is a native of Guinea, from which we have wild specimens gathered by Barter and others. We have it also from Central Africa, collected by Schweinfurth and Grant, and Abyssinia by Beccari, and what is most likely the same from the Zambesi country, gathered by Sir John Kirk in 1860; the latter accompanied by a sketch made on the spot, when he was botanist to the Livingstone expedition.

On the Zambesi *S. guineensis* appears to be called "Konje," and Sir John Kirk speaks of it as "yielding a valuable fibre similar to Manilla hemp." It is described as "growing in great abundance in many places, keeping to the shade of woods."

Mr. Horne, Director of the Royal Botanic Garden, Pamplemousses, mentions that—

"This plant thrives well in Mauritius in damp marshy places in the 'lowlands.' I have no doubt that it would thrive well in the wet 'uplands.'"

It is widely distributed in the West Indies, and has been grown experimentally for the sake of its fibre at St. Thomas, Jamaica, and Trinidad.

As regards cultural treatment, the following information is taken from notes prepared by the late director of the Botanical Department, Jamaica, on this and *S. zeylanica*—

"In the first instance plants may be put out at 3 feet by 3 feet, which, allowing for roads and paths, would give

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about 3000 to the acre. If the soil is kept well broken and moist, these plants, by the extension of root suckers, will spread in all directions, so that ultimately the whole ground, with the exception of certain paths which should be kept permanently open, will be covered with plants. As regards the time which must elapse between planting out and the first yield of leaves suitable for fibre, there would appear to be a great difference of opinion. Plants which I saw at St. Thomas at three years old were only just ready to be cut; and Baron Eggers, who had planted them and kept them under close observation during the whole of that time, was of opinion that *Sansevieria* plants could not be depended upon to yield a crop before three or three and a half years.

"My own experience coincides with this, but necessarily much must depend upon the nature of the plants when first put out, the character of the soil, the amount of moisture received, as well as on the system of cultivation pursued.

"From actual trial tests in India, where one-third of an acre was cultivated with *Sansevieria zeylanica*, it appears that full-grown leaves of 3 to 3½ feet long (their actual age is not mentioned) yielded about 1 lb. of clean fibre for every 40 lbs. of fresh leaves. That is, the weight of clean, dry fibre was at the rate of 2½ per cent. of fresh leaves. Dr. Roxburgh calculated that one acre would yield 1613 pounds of clean fibre at a gathering, two of which may be reckoned on yearly, 'in a good soil and a favourable season, after the plants are of a proper age.'

"This would be at the rate of 1½ tons of fibre per acre per annum at the end of three and a half years, of the gross value (at the rate of £30 per ton) of £45. Whether this return can be depended upon for the West Indies on an extensive area I am unable to say."

In an experimental trial carried on at Jamaica, 1185 lbs. of green leaves of *S. guineensis* yielded 29 lbs. 10 oz. of dry fibre. This was cleaned by machine. The reports of brokers were as follows:—(*a*) "Value, £18 per ton, mixed fibre partly uncleaned." (*b*) "Poorly cleaned, a good deal of mixture in it, not so strong; value, about £25 per ton." (*c*) "No good in the state sent; it has a lot of bark in it, and requires more dressing; both ends are cleaned, but the centre is dirty. Price, if dressed properly, would be as good as *S. zeylanica*, viz. £30 per ton."

In September last, His Excellency Sir William Robinson, Governor of Trinidad, forwarded to Kew samples of fibre of this species, which he stated had been prepared "at the

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convict depôt at Chaguanas, without the aid of machinery of any kind." The report of Messrs. Ide and Christie on the Trinidad sample was as follows—

"In point of cleanness and softness of fibre it seems well prepared; but to compete successfully with Manilla hemp it would require to be of a better colour and of equal if not superior strength. We value it for rope-making purposes at £20 per ton in London. The small piece of Manilla fibre which we enclose has a value to-day (September 24, 1886) of £31 per ton."

A few leaves taken from plants grown at Kew were recently passed through Death's fibre machine; but the result, owing to the smallness of the quantity and the necessity of adjusting the machine to the size of each leaf, was not satisfactory, but it is not devoid of interest. The report of Messrs. Ide and Christie on the sample of fibre submitted to them was as follows—"Short, and only moderate strength. Value, £23 per ton. We reported on fibre from this plant from Trinidad in September last, when we valued the sample at £20 per ton. The difference now is due solely to the advance in the price of Sisal hemp."

Of samples of fibre of *S. guineensis*, the Kew Museums contain one specimen machine-cleaned from Jamaica, sent by Mr. D. Morris, 1884, with the following note:—"Leaves 3½ to 4 feet long, broader than *S. zeylanica*, mottled, unarmed, common and easily propagated." A specimen from Trinidad, cleaned by hand, forwarded by Governor Sir William Robinson, and valued by Messrs. Ide and Christie at £20 per ton. Also a leaf, rope, and fibre from S.E. Africa, sent by Mr. T. Baines. A specimen of leaf and fibre from Sir John Kirk appears under the following label, "Maculated Sansevieria, called 'Konje,' near Laputa, 1860." This is probably identical with *S. guineensis*.

2. SANSEVIERIA LONGIFLORA, Sims, a native of Equatorial Africa, was first figured and described by Dr. Sims in 1826 at Tab. 2634 of the *Botanical Magazine*. The leaves are very like those of *S. guineensis;* but as grown with us they are larger, flatter, not so firm in texture, and not invariably blotched with green. The best character by which it may be known from *S. guineensis* is the flower, which is 3½ or 4 inches long, instead of 2 inches. We have specimens in the Herbarium with flowers as large as this from Guinea gathered by Barter and Mann; from the Congo by Prof. C. Smith; from Zambesi country by Mr. Buchanan; from Angola by the late Mr. Monteiro; from Niam-niam Land by Dr. Schweinfurth.

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Whether all these are the same species it is impossible to say at present. There is also a large-flowered species, called *Sansevieria bracteata*, which was gathered by Dr. Welwitsch in Angola.

In 1879, Sir John Kirk forwarded, through the Foreign Office, a specimen of fibre from the leaf of a species of *Sansevieria* found growing on the mainland opposite the island of Zanzibar. The specimen sent was the produce of a single leaf, the length of which was 9 feet. The report of Messrs. Noble on this specimen was as follows:—"We have carefully examined the fibre from East Africa; it is worth as a hemp £22 per ton at the present time (1879)."

Recently Sir John Kirk has been good enough to furnish more detailed information as regards the plant yielding this fibre, which leads us to conclude that it is probably *S. longiflora*, Sims (see footnote p. 707). In a letter dated December 1886, he mentions—

"It grows abundantly near Pangane, on the mainland opposite the island of Zanzibar, and in the district between that and Mombasa, and is used by the natives to yield a long and useful fibre of which I sent specimens to Kew some years ago.

"This plant has flowered with me at Mbwéni in the island of Zanzibar, but the soil being too dry and sandy it did not succeed very well.

"The flowers are on a stalk crowded in a head, not racemose, or in a spike, as in another species common on the island. Unfortunately my flowering specimens rotted in drying, so that I have never been able to send home the inflorescence for identification. The leaves which yield the fibre are at first flat and clouded, but after a time the lower part becomes much elongated, round and grooved on the upper side, the end only remaining flattened and not so mottled. It is a plant worth being introduced to our tropical colonies."

Several plants of this species are growing in the Palm-house at Kew, from which it would appear that it is a very free-growing and robust species. Some leaves from these plants were lately tested for fibre by means of Death's fibre machine, which yielded at the rate of 1·69 per cent. of clean dry fibre. The report of Messrs. Ide and Christie on specimens thus prepared was as follows—"A very bright, clean, strong fibre, and in every way a most desirable commercial article. It would compete with the best Sisal hemp for rope-making purposes. Value, £30 per ton."

There is little doubt that from the robust habit and size

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which this species is capable of attaining, it is a most valuable fibre-plant. As reported by Sir John Kirk, a single leaf of what we take to be the same species under favourable circumstances attains a height of 9 feet; and from one such leaf excellent fibre weighing ¾ oz. has been produced. This and other examples of fibre are in the Kew Museum, No. 2.

3. Of SANSEVIERIA KIRKII, Baker MS., we know the leaves only, but it is evidently a distinct species. It was sent to Kew by Sir John Kirk in October 1881, as a native of the east coast of Africa. We have had it in cultivation at Kew since that time, but so far it has not flowered. The leaf is oblanceolate in shape and very horny in texture. We have only grown it to a length of 2 feet, with a breadth in the middle of 3 inches. The leaf is dull green with a distinct brown edge, and is much mottled on both sides. The base is much thicker, and its edges are more incurved than in either of the three other comparatively flat-leaved kinds, and down the back of the lower part of a leaf run about five distinct grooves, a character which distinguishes it readily from *S. guineensis* and *S. longiflora.*

Specimens of fibre prepared from *S. Kirkii* yielded at the rate of 1·69 per cent. by weight of the green leaf. They were described by Messrs. Ide and Christie as follows—"Rather stout, but very clean and good colour; the strength fair. Value, £27 per ton."

4. SANSEVIERIA THYRSIFLORA, Thunb., is the species on which the genus Sansevieria was first constituted by Thunberg in the year 1794. The leaf is nearly flat, and does not reach above 1 foot or 1½ feet in length, and is 1½ inches or 2 inches broad at the middle, with abundant mottling and a distinct red edge. The flower does not differ from that of *S. guineensis.* It is a native of the eastern parts of Cape Colony. Zeyher gives the place of growth as "Uitenhage, in woods of Zwartkops, and many other places in the east of the colony; *Kei* of the Hottentots: a decoction of the root used for dysentery."

The leaves of this species growing at Kew were too small to be tested for fibre.

5. SANSEVIERIA ZEYLANICA, Willd., is a very well-known and well-marked plant. It is a native of Ceylon, and long before Linnæus was figured and described by Royen, Commelinus, and Plukenet. There are eight or ten leaves in a tuft, and they are semi-circular in transverse section, 1 or 2 feet long, rounded on the back, deeply channelled down the face, ⅓ or ½ inch thick in the middle, in colour dull green, copiously banded

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with white, with a distinct red margin. The peduncle and flower-spike are each about a foot long, the flowers being rather smaller than in *S. guineensis*, but quite similar in structure. It is well figured in Redoute's *Liliaceae*, tab. 290, and in the *Botanical Register*, tab. 160, in the year 1816.

In Ceylon this species is known under the Singhalese name of *Neyanda*. It is indigenous to the hotter parts of the island and the fibre yielded by it is used in numerous ways, such as strings, ropes, mats, and a coarse kind of cloth. In India the plant is known as *Moorva*, *Moorga*, or *Marool*. Sir William Jones, in the *Asiatic Researches*, vol. iv., p. 271, mentions *S. zeylanica* under its ancient Sanscrit name of *Moorva*, and he says that: "From the leaves of this plant the ancient Hindoos obtained a very tough elastic thread called *Maurvi*, of which they made bowstrings, and which for that reason was ordained by Menu to form the sacrificial zone of the military class." Dr. Roxburgh describes the plant as common on the jungly salt soils along the coasts, growing under the bushes, and easily propagated on almost every soil, from the slips which issue in great abundance from the roots, requiring little or no care, and not requiring to be renewed often, if at all, as the plant is perennial. The leaves when thus cultivated are from 3 to 4 feet long.

Mr. Horne makes the following note on this plant at Mauritius—

"Several species of *Sansevieria* are common here in waste lands, near the sites of old gardens, and by the roadsides. They are not so readily nor so cheaply established on land as the *aloës vert*. But they yield a good fibre, which is used for cordage, etc. It has the reputation of being one of the strongest of fibres. It is known by the name of ***bowstring hemp*** and *Moorva*."

Generally in Ceylon and India the natives prepare fibre from this plant by retting, or by simply beating and scraping. Full-grown leaves yield at the rate of 7·87 per cent. of weight of the green leaves. Owing to the smallness of the individual leaves they are difficult to clean by machinery, but if it were possible to separate the fibre by a chemical process, this plant would become of great commercial value.

Of samples of *S. zeylanica* fibre the Kew Museums contain one specimen from Ceylon, sent by Dr. G. H. K. Thwaites, under the name of Neyanda fibre; one labelled Moorga or bowstring hemp, from Jamaica, from Mr. D. Morris, 1884, with the following note attached—"Longest leaves 3½ to 4 feet long, narrow, mottled, unarmed, very common and very

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easily propagated either by root, suckers, portions of the leaf, or seed." There are also samples from the Botanic Garden, Mauritius, sent by Mr. Duncan; from Mysore, obtained from the India Museum, besides rope and twine from Balasore and twine from Cuttack, likewise from the India Museum; a Singhalese whip and nose-strings for harnessed bullocks from Kandy, sent by Mr. J. A. Ferdinandus; a sample of paper half stuff from the India Museum; and some fibre, dyed in two colours (red and blue), from Madras by Dr. Hunter.

Samples of fibre of *S. zeylanica* prepared at Jamaica by machinery, in 1884, were described as follows by London brokers:—(*a*) "Beautiful fibre, rather heavy and hard, might be whiter, value very uncertain, £20 to £35 per ton." (*b*) "Rather dull in colour and short in growth, fairly well cleaned. Value, about £30 per ton." (*c*) "Might be whiter. It is almost too good for roping purposes. Worth about 30 per ton."

6. Of SANSEVIERIA CYLINDRICA, Bojer, an excellent figure and a full account by Sir William Hooker will be found at tab. 5093 of the *Botanical Magazine*. It is a most distinct and curious-looking plant. The leaves are cylindrical, round in horizontal section, faintly sulcate all round, especially in the young state, obtuse at the end, arching; reaching, when fully developed, a length of 3 or 4 feet and a thickness of about an inch. The peduncle is about a foot long, the raceme much longer, with clustered cylindrical flowers just like those of *guineensis* in structure, but only about an inch long. It is spread across South Africa from Zanzibar to Angola. Our Kew plants were received by the Foreign Office from Angola in 1859 under the name of Ife, and an abundant supply of its fibre, and ship's cables and other ropes manufactured from it, were shown in the Portuguese Department of the Paris Exhibition in 1858.

In the description attached to the figure of the plant in the *Botanical Magazine* mentioned above, Sir William Hooker adds the following particulars—

"About three years ago (that is in 1857) there were received at the Foreign Office, and transferred to the Admiralty, samples of a peculiar fibre and cordage under the name of Ife, said to be derived from a new plant at the Portuguese settlement, Angola, West Coast of Africa. These were accompanied by some apparently living plants, which were placed in the cellars of the Foreign Office, and by the kindness of our valued friend, G. Lenox-Conyngham, Esq., forwarded to Kew, where they soon recovered, and have since flowered. The habit of the plant was that of *Sansevieria*, but the leaves very dark coloured, and quite terete and solid

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in the interior, very unlike any known species of that genus. My duties at the Paris Exhibition of 1855 led me to the careful investigation of the vegetable products, and I was there agreeably surprised to find most extensive samples, in the Portuguese department, of the raw material fibre, and manufactured articles, ship-cables, rope, beautiful cordage, etc., of the same material; and amongst 'The Products of Angola,' it is thus stated in my report—'*Fibre* marked from *Sansevieria angolensis*, this latter being a MS. name of Dr. Welwitsch for a remarkable species of *Sansevieria*, with long, stout, terete leaves, which is in cultivation at Kew. The cordage and rope made of this plant appear to the eye of excellent quality, whatever experience may prove them to be.' Experiments recently made with this cordage have shown it to be the strongest and best-fitted for deep-sea sounding of any fibre known; indeed this is the less surprising, seeing that other species of *Sansevieria* (the well-known *S. zeylanica* and *guineensis*, for example) are cultivated in almost all tropical countries on account of the strength and durability of the fibre, under the name *Bowstring hemp*."

Of samples of *S. cylindrica* fibre in the Kew Museums, there is one specimen from Mauritius sent by Mr. Duncan; fibre of the Probo, and rope and cordage made from it, probably *S. cylindrica*, Sierra Leone, Commodore A. Eardley Wilmot, H.M.S. *Rattlesnake*. The following note accompanies this specimen—"Grows abundantly; can be easily propagated." There is also a specimen labelled Mokhosi fibre and leaf, probably *S. cylindrica*, used for making cordage, etc., marked "S.E. Africa, T. Baines, Esq."

Specimens of the fibre prepared from plants growing at Kew by Death's fibre machine were described by Messrs. Ide and Christie as follows—"This is the second best fibre amongst the samples sent, and except that it does not appear as strong, it is almost equal to *S. longiflora*. Value, £28 per ton."

7. We have at Kew a dried specimen, as well as living plants, of S. SULCATA, which appears to be an unpublished name of Boger's. The plants, probably from East Africa, have never flowered, but in leaf character they are very similar to *S. cylindrica*. Under cultivation they are shorter and more slender, with rather deeper vertical grooves, but no bands or markings. A small sample of the fibre of *S. sulcata* was prepared, and the brokers' report upon it was as follows—"Similar to fibre of *Furcræa cubensis*, and of about equal strength. It is however cleaner, and would also compare with Mauritius hemp. Value, £26 per ton."

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It is quite possible that other species of *Sansevieria* may be found in Tropical Africa, whilst some, more or less distinct, may be under cultivation in colonial gardens. The illustrations given on page 3 of this bulletin [*see* pp. 708-9] will assist in the determination of the species mentioned here. Specimens of any other will be gladly accepted for the Kew collections.

In his synopsis of succulent plants Haworth described briefly a number of additional species of *Sansevieria*, which are now lost to cultivation so far as we are aware, and of which no figures or dried specimens are known. It is not improbable that there are many more types in existence than we possess materials for individualizing or recognizing at present. Of plants once in cultivation which Haworth briefly notices, we should be glad of information or specimens of the following: *S. lætevirens*, *S. ensifolia*, *S. glauca*, *S. polyphylla*, *S. grandicuspis*, *S. pumila*, and *S. fulvocincta*.

As regards machinery for the extraction of fibre from these plants, the subject is one that lies outside the scope of the *Bulletin*. Machinery is in use in Yucatan and Mauritius for the extraction of fibre from *Agave* and *Furcræa* leaves, and machines are said to be made suitable for the treatment of leaves of *Sansevieria* and others. We cannot do better, however, than refer to the literature given on this subject in Spon's *Encylopædia*, Div. iii., pp. 923-930.

In the chemical extraction of fibres from plants there are several methods under experimental trial, some of which may prove ultimately successful.

D. M.

## SISAL HEMP.[1]

SISAL HEMP, Henequen, or Yucatan hemp, is produced by a species of *Agave*, native of Mexico, of which the common "American Aloe" is the type. There are two if not more varieties cultivated for fibre. The chief one is the "Sacqui" (*Agave rigida, var. longifolia*). Plants were received at Kew in 1879, and again in 1890. The other is the "Yaxqui" (*Agave rigida, var. Sisalana*). The former has leaves with side teeth and a strong terminal spine; the latter has the terminal spine only; the edges of the leaves are smooth.

*Cultivation.*—These Agave plants are propagated either by suckers from the base of the stem, by seed, or by bulbils (called "pole" plants) produced on the flowering branches. The latter appear in the axils below the flower, and number many thousands. They remain in the parent plant until

[1] From paper by Mr. D. Morris, C.M.G., Assistant Director Royal Gardens, Kew, "On Commercial Fibres," *Tropical Agriculturist*, 1895-96.

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they are about 4 to 6 inches long, and sometimes much longer. The land suited for the cultivation of Sisal hemp is entirely different from that required for Manilla hemp. The best fibre districts in Yucatan possess an arid climate, with gravelly, stony, or rocky soils; they are only a few feet above the level of the sea; the summer heat is intense. It is claimed that the fibre is stronger and more abundant in dry hot soils than in rich deep soils. The plantations are formed with young plants about 18 to 20 inches high. These are put out in rows, at distances varying from 6 to 12 feet, equal to about 600 to 1000 to the acre. Broad lanes are left here and there for the purpose of making roads or tramways, all converging on the factory, where the leaves are cleaned. A plantation begins to yield in three to five years, depending on the size of the plants when first put in, and the nature of the soil and cultivation.

*Harvesting.*—When the leaves are fit to cut, ten to twenty are taken from each plant, beginning from below. The cutting may be repeated two or three times a year, according to the vigour of the plants. As soon as the plant shows signs of "poling" it is regarded as useless for fibre purposes. The pole is cut out and the remaining leaves are harvested soon after. To provide for the continuance of the plantation, it is the custom to place at the foot of each plant (when about three-fourths of its life are spent) a small plant, which replaces the old plant when the latter is removed. The period of the life of a plant may extend from five to ten years or more. Cutting the leaves too severely will accelerate the poling of the plant and thus destroy its usefulness.

*Extracting the Fibre.*—The leaf-cutters are paid at the rate of 25 cents per day for 200 leaves. The leaves are conveyed from the fields to the factory either on mule-back or by means of light tramways. Each mule carries 200 leaves each trip; a task of 10,000 leaves requires ten trips, with five mules each. On the tramway a mule can draw a wagon with 3000 leaves, and make five trips a day. Most of the large fibre estates in Yucatan are provided with light portable railways on the French Decauville system. The more common machine used for extracting the fibre is the *raspador*. It is a rude piece of machinery, consisting simply of a wheel like a four-footed pulley with a 6-inch face. Across the latter are fitted pieces of brass an inch square and 6 inches long, running across the face about a foot apart. This wheel runs in a heavy wooden frame, and makes about 110 revolutions per minute. The leaf is put in at one end of the machine and held by a strong clamp while exposed to the heaters.

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The pulp is soon crushed out of it, leaving only the fibre. The leaf is then reversed, and the other end cleaned in the same way. The average work of one machine, requiring 1½ horse-power, is 7000 to 9000 leaves per day, with two men feeding. It is estimated that 1000 ordinary leaves will yield 50 lbs. of dry fibre. Exceptionally they will yield 100 lbs., but from strong plants from five to seven years old, 75 lbs. would be a good yield. After the fibre is cleaned, it is spread out in the sun to dry. It is afterwards pressed into bales by lever or screw presses, or by hydraulic pressure. The latter method is becoming general. The bales vary from 350 to 400 lbs., with a cubic measurement of 22 feet. It is calculated that the total cost of growing and cleaning the fibre and of delivering it at Progresso, the port of shipment, is about 3½ cents to 4 cents per pound, Mexican money (about 1¼*d.* to 1½*d.* English money).

*Position of the Industry.*—The fibre plantations in Yucatan are estimated to cover about 24,000 acres. The total yield in 1894 was 350,000 bales of 375 lbs. each, giving a total weight of 131,250,000 lbs. For the whole country, this would be at the rate of 760 lbs. per acre. The actual return is probably a good deal more, as the total area under cultivation is not all yielding fibre. The estimated yield of the Yucatan plantations in 1895 was 400,000 bales. A State duty of 20 cents per 100 lbs. is levied on hemp exported from Progresso. A detailed account of the fibre industry in Yucatan is given in the *Kew Bulletin*, 1892, pp. 272-277, and 1893, pp. 212-218. The latter was prepared by her Majesty's Vice-Consul at Progresso. A general account of Sisal hemp plants, and efforts to start industries in various countries, is given in the *Kew Bulletin*, 1892, pp. 21-40. Attached to this is a return of the average price per ton (spot value) obtained for Sisal hemp in this country for each month from January 1879 to December 1891. The following is a brief summary, based on this return, brought down to September 1895—

| Year | Highest | | Lowest | | Average for the year | |
|---|---|---|---|---|---|---|
| | £ | *s.* | £ | *s.* | £ | *s.* |
| 1879 . . . | 32 | 10 | 21 | 0 | 24 | 0 |
| 1883 . . . | 29 | 0 | 24 | 0 | 27 | 0 |
| 1889 . . . | 56 | 10 | 45 | 0 | 50 | 0 |
| 1894 . . . | 20 | 0 | 15 | 0 | 17 | 10 |
| 1895 . . Jan. to Sept. | 17 | 0 | 13 | 0 | 14 | 7 |



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The fall in prices, so marked in the United Kingdom since 1889, was equally prevalent in the United States. This will appear from the following—

| Price per lb. in New York Dec. 31 | 1892 Cents. | 1893 Cents. | 1894 Cents. | 1895 to Sept. Cents. |
|---|---|---|---|---|
| | 6 to 6¼ | 3⅞ to 3 1/16 | 2⅝ to 2¾ | 2½ to 4⅝ |

*Note added.*—The monthly report on Sisal on September 15, 1895, showed a more favourable tendency. The spot value was £16 to £17 per ton.

## SISAL HEMP IN THE BAHAMAS.[1]

ON Inagua Island, the most southern of the Bahamas group, there is a stone building known as the salt-house, under the ample roof of which frequently sounds the clatter of a vigorous donkey-engine. Entering the building, the first sight to meet the eyes is a heap of sharp-pointed, deep green leaves, which a negro is feeding, one by one, into a rapidly-revolving machine. At his right lies a pile of long, powerful fibre, such as is used in rope-making. Near by is a cart into which a boy is throwing the vegetable waste or pulp which he gathers from beneath the machine. This bagasse, as it is called, is wet with sap, and so strongly acid as to kill other vegetable growth with which it may be brought into contact. The fibre is the product, the bagasse the refuse (as yet unused) of the Sisal leaves. These are about 4½ feet in length, averaging longer than do the leaves of the same plant grown in Yucatan. At the base, where they have been cut, they are thicker than a man's hand, and from 3½ to 5 inches in breadth, running from this to a point so fine and hard that it can be used as a stiletto. The edges are armed with slight spiny serrations. An attendant with knife and maul removes the sharp points, crushes the thick ends, and divides each leaf longitudinally. Each strip is fed by the negro in charge into the mouth of his machine, through which it is carried half its length by the rapidly-revolving cylinder. It is then drawn out, which scrapes the bagasse from it. Reversing the strip, the operation is repeated, and the result, a long, white "switch" of fibre, is added to the pile already noticed. The fibre is now washed in salt water (which gives better results than if fresh water is used), after which the hanks are hung in a drying-house, or, better still, in the sun

[1] Edgar Mayhew Bacon, *Nassau Guardian*, 1891—*Tropical Agriculturist*, 1896.

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till perfectly dry, when the material is ready for baling and shipment. An old turtle tank or "crawl," cut out of the soft calcareous rock, with a small hole in the wall which divides it from the ocean, so that the tide can flow in and out, makes an excellent basin for rinsing the fibre.

Sisal closely resembles the Manilla hemp of the Spice and Philippine Islands, when prepared for market, and is not unlike it when growing. In Yucatan they are generally known as Hennequin. They possess in varying degrees the strength, length, and lustre of fibre upon which the market value depends. The Sacqui, botanically known as *Agave ixtli*, introduced some years ago into Florida under the name of *Agave sisalana*, and often called Maguey, has received the greatest attention from Mexican (Yucatan) cultivators. The plant which is being cultivated in the Bahamas was at first called "Pita," and, although greatly resembling the Sacqui, is considered a superior kind. A number of more or less worthless plants having apparently the same general characteristics are to be found throughout the West Indian Islands. A gentleman in Jamaica with 500 acres prepared for hemp-planting, recently showed me the plants which he proposed to use, and which he imagined to be good Sisal. They were the valueless Keratto, the leaves of which might deceive any but an expert, but which upon being cleaned produce a fibre so weak that its cultivation would be utter folly.

A full-grown Sisal plant has sixty to eighty great leaves growing around a common centre, which incline from a group of upright undeveloped ones in the middle of the cluster to an outer circle that is nearly horizontal. Many leaves measure over 6 feet in length, but the average length of the "ripe" ones, as already stated, is 4½ feet. The average number of leaves which may be procured from each plant annually, is over forty, being in excess of the Yucatan production. The separation of the leaf from the plant is made with a knife near the base, and ripe leaves may be cut from two and a half years old plants, although the length of time required for maturity differs in different localities. One cutting does not exhaust the plant. It may be stripped annually, or even more frequently, for twenty years, and when it shows sign of age may be replaced by a sucker, of which the careful Sisal cultivator will be sure to have a nursery full for such emergencies. The propagation of the Sisal is either by seeds or suckers. The latter spring up around the mature plant constantly, and should be carefully removed, because

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they sap the life of the parent, and also for the reason that they are most valuable for replanting. When plants remain uncut for too long a time, a huge flower-stalk shoots up from the centre to the height of 18 feet. After having flowered and matured its seeds the plant invariably dies.

Experienced growers use 650 plants to the acre, in rows 11 feet by 6 feet distant from each other. This will give room for the labourers to walk between the rows without being wounded by the terrible spurs which, like a cluster of keen spears, make each plant a menace to the unwary. Besides this, the closer planting would result in the piercing of innumerable leaves every time the wind blew, and the consequent destruction of much fibre. Stabs and bruises mean discolouration, and the expense of sorting damaged lots, apart from the proportional loss, would be an added and not insignificant item in the labour account of a plantation. Many people who have caught the "Sisal fever" are planting acre after acre, expecting nothing less than that the farms, when planted, will take care of themselves. To be successful in this enterprise requires unceasing activity and care. One must be Argus-eyed. One season of poor prices, with the constant discouragement which is apt to follow in the case of nine small proprietors out of ten, in a country where the peasantry are all negroes, will result in an overgrowth of suckers and the poling of mature plants till nothing short of absolute clearing and starting anew will save the farms. There is no cultivation where system and perseverance are more necessary to success. The dropping of the seed from a single "pole," if not watched and attended to immediately, will produce little spears enough to destroy a hundred plants, and I have frequently seen a dozen suckers start up around and under the leaves of their parent. After such crowding the leaves would be worthless, even could they be reached; but no man, unless arrayed in metal armour strong and stout enough to withstand the thrust of steel, would be so foolhardy as to attempt to penetrate such a growth. What I want to impress is the fact that without that patient and systematic care, which I have nowhere observed as characteristic of the un-led negro, a field of Sisal is as valueless as a field of mullein.

The hardiness of the Sisal is something wonderful. It grows best on lands which seem good for nothing else. Rock land where the hardy sage, the sword-plant, or cactus crowd the stunted, gnarled hard-wood trees; where the fissures in the sun-hardened limestone are filled with a dry, sandy soil,

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and hardly a barrelful of that to the acre, will produce Sisal. If hard pushed, it will grow in the air, without soil; I have twelve living plants which I kept shut up for eighteen months in a cigar-box without light, air, or water. But such growth as will result in a marketable commodity is a different matter. That requires a soil not too rich, which induces fatness and loss of fibre; not too poor, or the plant grows dwarfed. The ground must not be too wet or too dry.

When the right spot has been found; when the selection of seeds or suckers, the preliminary preparation, has been accomplished; then, the choice of season hastens or retards the work of preparing the ground for the reception of the plants. Of course there is no winter; no frost or cold to contend with; no blizzard to calculate for. But there are rainy and dry seasons. One must calculate so that the necessary burning of cut brush and trees will not occur when the fires are liable to be extinguished by the violent downpour of the "winter" rains, nor the planting delayed until the dry months interfere with the advance of the young plants. All the ground is gone over first with the "machete," a long heavy cutlass-like knife, which the negro uses either as a tool or weapon. All trees and underbush are cut down except the very large ones, which require an axe; then the stumps are grubbed up so far as they are likely to interfere with the work. Next fire is employed, and quickly runs over the acres where the negroes have toiled in gangs with their cutlasses. In this work of clearing, women are often found more satisfactory as labourers than men; they receive but 36 cents where the men get 50 cents. Few labourers are paid by the day, "task-land" is the usual method. In clearing brush-land in the Bahamas, one-fourth of an acre is a task. When, at last, all the clearing and planting has been done, and thousands upon thousands of perfect plants, in absolute symmetry of arrangement, with unbroken ranks, their rich green showing no blemish, stretch before the eye, the spectator (especially if he has a financial interest in the plantation) feels that there is a beauty apart from mere picturesqueness. The present boom in Sisal in the Bahamas, like all excitement of the kind, doomed, without doubt, to considerable depression in the future, will not be without beneficial results; there will remain a new industry, a source of greater prosperity to a people who have been for many years almost inactive.

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# APPENDIX F

## SIR JOHN KIRK'S GARDEN AT ZANZIBAR [1]

As pointed out in the *Kew Bulletin* for 1893, p. 363, numerous notices have appeared in these pages recording the attempts made, by means of the Botanic Station system, to develop the material progress of the West African colonies.

So far, however, it has not been formally applied to the British possessions on the East Coast. The transmission of tropical plants, suitable for cultivation in those territories, is not unattended with difficulty, and a convenient station on the coast, where they could be propagated, and from which they could be drawn, would undoubtedly be of great utility to intending planters both in British East and in British Central Africa.

As regards the latter territory, Mr. Alexander Whyte, acting under the instructions of Sir Harry Johnston, K.C.B., H.M. Commissioner and Consul-General, commenced a small botanical garden in 1891 at Zomba, the head-quarters of the administration. An account of the enterprise is given in the *Kew Bulletin* for August last (pp. 186-191). The site is, however, some 400 miles from the coast, and plants transmitted from England can only reach it by the Zambesi. There is every reason, however, to believe that the Shiré Highlands will become the seat of an important planting industry. Coffee was introduced as long ago as 1878. It has been cultivated with great success by the Messrs. Buchanan, and thirty estates "have been opened up." Shiré Highland coffee commands a high price on the London market.

The first attempt to establish a depôt on the East Coast was due to private initiative.

[1] Reprinted by special permission of the Controller of Her Majesty's Stationery Office, from "Botanical Enterprise in East Africa."– Royal Gardens, *Kew Bulletin* for March and April 1896, Nos. 111, 112.



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As stated in the *Kew Bulletin*, 1892, p. 87, "during the time Sir John Kirk, G.C.M.G., K.C.B., was Agent and Consul-General at Zanzibar, he maintained at his own expense an experimental garden in which he tried every useful tropical plant likely to be adapted to the climate. These were for the most part supplied from Kew."

Apart from this, he took, from his first residence in the country, an enthusiastic interest in the botany of Tropical East Africa, and his collection of specimens of its little-known vegetation are amongst the most important available for the "Flora of Tropical Africa" in preparation at Kew.

He was not less interested in promoting industries that have since proved of the utmost value both to the natives and to Europeans in that part of the world.

The utility of work of this kind, fortunately, does not cease with the removal of the hand which carried it on. The benefits which are still derived from Sir John Kirk's garden in Zanzibar are illustrated by the following passage in Mr. Alexander Whyte's *Report* on Botanical Work in British Central Africa, lately published by the Foreign Office, and already cited in the *Kew Bulletin* (1895, p. 187)—

"During the short stay of Mr. Johnston's expedition at Zanzibar in June 1891, Captain Sclater and I visited Sir John Kirk's old garden a short way out of town, which is now a station of the Universities Mission. Through the kind courtesy of the lady missionaries, I procured the seeds of a good many economic and ornamental plants from the garden, such as Liberian coffee, *Casuarina*, cassias, guavas, anonas, passifloras, mango, orange, cucurbitaceous plants, pineapple shoots, etc., and nearly all of them are now doing well at Zomba. I also brought with me a supply of ripe cacao-pods, from the same garden or plantation, which plant had been introduced years ago by Sir John Kirk. The seeds from these pods, I regret very much to say, failed to germinate."

A fuller account of the present condition of the garden is contained in the following notes of a recent visit, taken from the *Zanzibar Gazette* of August 28, 1894—

"Mr. Crabbe, the Ceylon planter, who was passing through here last week on his way to Nyassaland, paid a special visit to Mbweni, for the purpose of noting the condition of the coffee plantations, started by Sir John Kirk at the close of his time here.

"Mr. Crabbe was well pleased with the condition of many of the trees, and as the crop was ripe and falling, he opened some berries, and considered some of the beans quite fine.

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He made several recommendations, which were duly transmitted to the Rev. J. Key, who takes great interest in the plantation, but who was unfortunately away from home at the time.

"The tea, which is now in full blossom, and affords a pretty sight, well worth a drive to visit, Mr. Crabbe considered a poor kind, and for the leaf hardly worth growing, and he did not recommend its extension.

"The cacoa he considered planted in too windy a site, but walking about the shamba, pointed out many spots on which he thought it could be planted to better advantage."

In the *Zanzibar Gazette* of September 11, 1895, there is an appreciative review of Sir John Kirk's work in East Africa. His services to botany and horticulture are referred to as follows—

"Besides these main features of his rule, minor affairs of the island were his constant solicitude. Agriculture, horticulture, experimental planting, the rearing of botanical specimens, all engaged his attention. The specimens of imported plants still to be seen in his old shamba at Mbweni, full of interest to the interested visitor who is lucky enough to find them, show how keen was his enthusiasm for the adornment of the place, while his efforts to establish a profitable occupation for the natives, in connection with coffee-planting and aloe fibre manufacture, may even yet bear fruit. Hardly is there a flower displayed upon a dinner-table in Zanzibar which does not owe its introduction into the island to Sir John Kirk; and had he remained here, with all the opportunities the place affords, Zanzibar might now be a floral and arboreal Paradise; as it is, his memory will be kept ever green in this way alone."

Almost every economic production of East Africa has, at one time or another, received attention from Sir John Kirk. He virtually created the rubber trade of the East Coast. This has attained in some years to a value of over £200,000. The plants yielding the rubber discovered by him are enumerated in the *Kew Report* for 1880 (pp. 39–42).

Again, plants of the East African copal, *Trachylobium hornemannianum*, were received from him, as well as specimens of the Bark Cloth of Uganda (*Kew Bulletin*, 1892, p. 58); Kew is also indebted to him for seeds and particulars of two new species of African plantains (*Musa livingstoniana* and *M. proboscidea*) as recorded in the *Kew Bulletin* (1894, p. 225).

A kind of dye-wood (*Cardiogyne africana*, Bur.), probably of economic value, was described by Sir John Kirk (*Journal*

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*of the Linnean Society*, ix., p. 229) as the produce of a new species of *Cudrania*. The edible fruit has somewhat the flavour of an insipid custard-apple. The tree ranges at least from the Zanzibar coast to British Central Africa, where it is apparently abundant. Bentham and Hooker (*Genera Plantarum*, iii., p. 362) refer it to *Plecospermum;* but now that the fruit is known to consist of free drupelets, it is better perhaps to give it generic rank.

Sir John Kirk's services to horticulture at home cover the whole period of his residence in Africa. The following list of plants introduced by him to European gardens, chiefly through Kew, is an interesting record of what is possible to be done by an enthusiastic and devoted traveller—

PLANTS INTRODUCED FROM EAST TROPICAL AFRICA TO KEW BY SIR JOHN KIRK.

*Aloe brachystachys*, Baker, n. sp.; *Bot. Mag.*, t. 7399.
*Aloe concinna*, Baker, n. sp.
*Aloe Kirkii*, Baker, n. sp.; *Bot. Mag.*, t. 7386.
*Aloe penduliflora*, Baker, n. sp.
*Chlorophytum Kirkii*, Baker, n. sp.; *Gard. Chron.*, 1882, i. 108.
*Clerodendron cephalanthum*, Oliver, n. sp.; *Ic. Pl.*, t. 1557.
*Crinum Hildebrandtii*, Vatke; *Bot. Mag.*, t. 6709.
*Crinum Kirkii*, Baker, n. sp.; *Bot. Mag.*, t. 6512.
*Drimiopsis Kirkii*, Baker, n. sp.; *Bot. Mag.*, t. 6276.
*Encephalartos Hildebrandtii*, A. Br.
*Hibiscus schizopetalus*, Hook. f., n. sp.; *Bot. Mag.*, t. 6524.
*Impatiens Sultani*, Hook. f., n. sp.; *Bot. Mag.*, t. 6643.
*Kæmpferia* (*Ceinkowskia*) *Kirkii*, n. sp.; *Bot. Mag.*, t. 5993.
*Keramanthus Kirkii*, Hook. f., n. gen.; *Bot. Mag.*, t. 6271.
*Landolphia florida*, Benth.; *Bot. Mag.*, t. 6963.
*Landolphia Kirkii*, Dyer, n. sp.
*Landolphia petersiana*, Dyer, n. sp.
*Landolphia Watsoni*, Dyer, n. sp.
*Musa livingstoniana*, Kirk, n. sp.; *Journ. Lin. Soc.*, ix. 128.
*Musa proboscidea*, Oliver, n. sp.; *Ic. Pl.*, t. 1777.
*Neobenthamia gracilis*, Rolfe, n. gen.; *Bot. Mag.*, t. 7221.
*Ochna Kirkii*, Oliver, n. sp.
*Sansevieria Kirkii*, Baker, n. sp.; *Bot. Mag.*, t. 7357.

In a letter published in the same number of the *Bulletin*, Sir John Kirk, discussing the question of a central station for the propagation and distribution of tropical plants on the East Coast, says—

"Between Nyasa and Zanzibar we have no interest, and as at Zanzibar and on the opposite mainland at Mombasa the

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climate is tropical, a separate station is there needed. Natal would not serve as a centre, partly from the distance, the want of rapid communication and the nature of the climate, that of Natal being sub-tropical, and not fitted for many of the plants that might thrive near the equator.

"The best point for a central garden to serve the Zanzibar and inland regions, would be a little inland from the port of Mombasa, which is a port of regular call by steamships. At a distance of from ten to fifteen miles inland, at the foot of the coast hills, or to the south in the Shiruba Hills, a suitable site with a rich soil and abundant water could be found.

"The further advantage of such a position is that it would be at the base of a railway-line, the construction of which is only a question of a short time, if we intend to hold our Protectorate in Uganda.

"Something might be said for making the station on the island of Zanzibar, where I had my experimental garden, but the climate and soil of the island do not suit many plants that might well be introduced. I would therefore prefer a mainland station, as near to Mombasa and the railway base of the future as may be."

No step has yet been taken to establish a depôt for British East Africa. Meanwhile Sir John Kirk's garden still continues to do useful service.

*Extract from the 'Gazette for Zanzibar and East Africa,' November* 27, 1895.

"The Rev. Père Mérel, only last week, on behalf of the Fathers of the Holy Ghost, took away with him a large quantity of berries for planting at their Mission station of Bura in the Taita district, these being kindly supplied by Miss Thackeray from her specimen plants at Mbweni, planted by Sir John Kirk.

"This has brought coffee-planting to our doors. We hope from time to time to publish intelligence helpful in these matters."

In a private letter, dated December 15, 1895, Sir J. Kirk writes in regard to his Zanzibar garden, which he transferred to Miss Thackeray of the Universities Mission—"It is a great satisfaction to know that the results have not been thrown away, but are even at this late date beginning to bear fruit. The Germans have long well appreciated the store of fruit trees and flowers, cuttings and seeds of which were to be had, and the tropical species of *Eucalyptus*, such as *E. citriodora* that I grew, are now common from seed obtained from my trees."

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# APPENDIX G

## THE CLOVE TREE[1]

"THE clove tree (*Caryophyllus aromaticus*)," says Rumphius, "appears to be the most beautiful, the most elegant, and the most precious of all known trees. In form it commonly resembles the laurel, and sometimes the beech. Generally of the height of an ordinary cherry tree, its trunk is straight, and rises to 4 or 5 feet before it throws out branches. The bark is smooth, thin, and adheres closely to the wood, which is hard and strong, but of an ugly grey colour, and therefore not suited for cabinet work."

"In the commencement of the wet season, which is the month of May in the native country of the clove (the Moluccas), the tree throws out a profusion of new leaves, the flowers grow in small bunches, upon branched peduncles, at the extremities of the boughs; they are of a delicate peach-blossom colour. The calyx is elongated and encloses the seed-vessel. As soon as the corolla begins to fade, the calyx changes its colour, first to yellow and then to red. It, together with the undeveloped seed, is at this stage of its growth (about four months old) the clove of commerce." It is at this period that the clove is fit to be used as a spice, and of course this is the period of harvesting. "If suffered to remain on the tree longer, the calyx gradually swells somewhat in the manner of that of a rose; the seed enlarges, and the pungent properties of the clove are in a great part dissipated. In this state it entirely loses its value as a spice, and is then called a 'mother clove,' which is only valuable as a seed for propagating the plant," and consists of a large ovoid purple berry containing one or two seeds. "The whole tree is strongly

[1] For this information I am chiefly indebted to the following works—Porter's *Tropical Agriculturist*, Nicholl's *Tropical Agriculture*, and Messrs. A. and M. J. Ferguson's *Spice Cultivation*.



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aromatic, and the petioles of the leaves have nearly the same pungency as the calyces of the flowers. The leaves themselves partake strongly of the qualities of the buds, and do not lose their aroma when dried; they may, therefore, form a good substitute in cookery."

"There appear to be five varieties of cloves, viz. the ordinary cultivated clove; the clove called the 'female clove' by the natives, which has a pale stem; the 'keri,' or loory clove; the 'royal' clove, which is very scarce; and the wild clove. The first three are equally valuable as spices, the 'female' being considered fittest for the distillation of essential oil. The wild clove has hardly any aromatic flavour, and is consequently of no value."

"Of all useful plants, the clove has perhaps the most limited geographical distribution. It was originally confined to the five Molucca Islands, and chiefly to Bachian; from these it was conveyed to Amboyna, a very short time before the arrival of the Portuguese. That part of Amboyna called Leytimur, and the Uliasser Islands, produced no cloves until the arrival of the Dutch, by whom the cultivation was restricted to Amboyna, and every effort was made to extirpate the plant elsewhere. To what distance from the parent country the culture might be successfully extended, there has been no opportunity of ascertaining. Rumphius informs us that the plant is not partial to large islands, and did not answer well in Gilolo, Ceram, Buru, or Celebes; and that it was probable that Buru and the Xulla Islands were the utmost western limits of its successful culture. The same writer adds that the Javanese and Macassars, when they were the carriers in the spice trade to the western emporia of the Archipelago, conveyed to their own country, with great care, young clove plants and mother cloves from which trees were reared, but produced no fruit. Through the speculative enterprise of Europeans the clove plant has in later times been cultivated so as to bear fruit in some of the western parts of the Archipelago, in the Mauritius, and in the West Indies. Clove trees have been cultivated for nearly fifty years in the Mauritius, where they bear fruit of inferior quality and high price. The fact seems to be that, like the grape, but in a much higher degree, the clove may be raised at a heavy expense but of inferior quality, in soil and climate little suited to it. How wonderfully restricted the soil and climate of the clove are, may be gathered from the well-known fact that in the parent islands the tree yields fruit in the seventh and eighth year of its growth, whereas in Amboyna, where it

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is an exotic, it does not bear until the tenth and twelfth year, and demands considerable care and attention."

"The clove does not thrive well near the sea, where it suffers from the spray, nor in the higher mountains, where it suffers from the cold."

"The soil which suits it best is a dark loam, having underneath a layer of dusky yellow earth, intermixed with gravel. A sandy soil, a hardy clay, and the rich damp ground in which sedges grow are to be avoided."

"The tree may be propagated either directly from the mother cloves, or by transplanting the self-sown seedlings found in the clove gardens. The plants raised by the first method (directly from seed) grow luxuriantly, but are alleged to yield more leaves than fruit; and from growing remarkably straight are difficult to climb for the purpose of collecting the harvest. The trees propagated by the second method are preferred, but the culture is laborious, and the success of the operation uncertain until the plants have attained the height of 5 or 6 feet. The young plants at first require the shade of other trees, and must therefore be planted under them. As they grow up the latter must be removed, leaving here and there a few fruit trees such as the *kanari* and the coco-nut, etc., the proximity of which it has been discovered is favourable to the clove."

"Clove trees must be kept pruned, and care must be taken that they are not choked with weeds, or by too many of the fruit trees just mentioned; failure in attention to these points causes the plants to languish or degenerate into wild cloves."

"Such is the culture requisite in Amboyna, where the soil and climate are foreign to the plant, and where much care and attention are required. In its native country, on the contrary, the clove grows luxuriantly and almost spontaneously, being propagated and coming to perfection with hardly any culture. In the Moluccas, as already mentioned, the clove tree begins to yield fruit in the seventh or eighth year, but at Amboyna not until the tenth or twelfth;" and in the former the trees are generally "topped" and kept within 8 or 9 feet high for the greater convenience of gathering the produce—but if left to nature they would attain a much greater height.

"Examples are given of clove trees living to the age of one hundred and fifty years, but the ordinary duration of their life in Amboyna does not average seventy-five. Much depends upon the nature of the soil and ground in which the trees have taken root. The clove, though generally a hardy plant, suffers from excessive drought, and is apt to be destroyed by

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the depredations of a worm which insinuates itself into the wood and kills the tree. In particular seasons thousands have perished from this cause."

So much as regards clove cultivation in the Moluccas and Amboyna; I will now add a few particulars regarding the attempts made to extend the culture of the plant beyond its native area, and the degree of success attained.

"M. Buée, the first cultivator of the clove tree in Dominica, obtained for his commencing essay only one young plant, about half a foot high, having no more than six or eight leaves. Pursuing the directions received with it, he planted it in rich soil, and in the shade of other trees. It did not, however, thrive, and he had the mortification of seeing it wither and soon die away. He then procured two other plants from Cayenne, and planted these near the house for the convenience of watching them, but the soil here was very poor. Fourteen more plants were subsequently obtained, and M. Buée planted these in various situations and soils. He found that the plant grew with sufficient luxuriance in a sterile soil, composed of a yellowish or reddish stiff clay, such as that in which the pimento flourishes, but which, for the generality of crops, is scarcely fit for cultivation. Sixteen hundred trees were afterwards raised from seed, which in a year from the first sowing were transplanted.

"The following is the manner in which M. Buée cultivated the plants in Dominica. The seeds were sown about 6 inches apart from one another in beds. Over these beds small frames were erected about 3 feet from the ground, and plantain leaves were spread on the top in order to shelter them from the sun. The leaves were allowed gradually to decay, and, at the end of nine months, the young plants by that time were strong enough to receive the benefit of the sun; but if not protected from it when very young they were found to droop and die.

"When transplanted the trees were placed at 16 feet apart. They grew very luxuriantly, and at the end of fifteen months after their removal attained the height of 3 to 4 feet. The ground where they were planted had previously been a coffee plantation for forty years. The coffee trees had decayed, and an attempt had been made to replace them, but they refused to grow, whereas the cloves flourished as if on congenial soil, and a crop was gathered from some of them when they were not more than six years old, which is two or three years earlier than the usual time of gathering.

"The cloves sent from St. Vincent to England in 1800 were

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obtained from trees 8 feet high, leaving a stem only 2 inches in diameter. Trial was made on this island of the relative growth of the plant on different soils. It grew sickly on land which was not manured, but on manured land it flourished. It should be planted in a situation not exposed to high winds."

The method of *gathering* and *curing* the cloves is substantially the same in both the Moluccas and Amboyna. As the cloves become ripe they are picked from the tree; if allowed to remain for one gathering alone, only part would be of any value, and the rest would be either in a too forward or too backward state to be used as spice. In the Moluccas, at the time of gathering cloths are spread on the ground (which in Amboyna is clean swept). "The nearest clusters are taken off with the hand and the more inaccessible with the assistance of crooked sticks. Great care is necessary that the trees in this operation should not be rudely handled, as an injury done to them in this way would prevent them bearing for years."

The *curing of the cloves* consists in placing them for some days on hurdles, where they are smoked by a slow wood fire which gives them a brown colour; and *afterwards* drying them in the sun, when they turn black, as we see them as the article of commerce, into which this last process converts them. In some places they are scalded in hot water before they are smoked; but this practice is not common. Such cloves as casually fall on the ground and are picked up in small quantities, the cultivators do not think it worth while to subject to the process of smoking; they are merely dried in the sun, which gives them a shrivelled appearance by which they are recognized, and lessens their value; a *properly dried clove* is of a light brown or tan colour.

The period of harvest in Amboyna is from October to December. "Of the fecundity of the clove it is not very easy to speak distinctly. The produce from one year to another is very unequal. At intervals of from three to six years the trees usually yield one extraordinary crop, but on the other hand, a year now and then occurs when they do not bear at all. Rumphius and Valentyn speak of a remarkable tree, a hundred and thirty years old, which in one year gave the enormous crop of 1100 lbs., and another year half that quantity. The proportion of about two-thirds of a clove plantation is considered to be bearing trees, the remaining third being allowed for barren and young trees. According to the data of 5 lbs. per tree and seventy-five trees to an acre,

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the produce will be 375 lbs. avoirdupois, and deducting one-eighth for young trees under ten years, 328 lbs. By a free culture, as in the case of pepper, a much larger produce than is here stated would no doubt be obtained."

I will conclude by a reference to the cultivation in the Straits Settlements—

"Penang cloves, like the nutmegs, have the reputation of being the best in the market, commanding a higher price than Amboyna (Moluccas) and Zanzibar cloves. Boys and girls from ten to fourteen years old answer best for the purpose of picking the buds. The gathering time lasts only a few days. The buds after being gathered are spread on large sieves or mats of loose texture, and dried under the shade of trees, or in sheds with palm-leaf covered roofs, and are then ready for the market."

As already remarked, a strong objection prevails against the direct sun-drying process, as it not only shrivels and blackens the buds but also evaporates much of their strength.

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# INDEX

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# INDEX


A

ABIRIKIMO, or dwarfs of the interior, 615
Abyssinia, cattle plague in, 347, 348
Acacia-tree, distribution of, 345
Accounts, complicated, 36, 71
Aden, trade with E. Africa, 60, 348, 503; possible extension, 568
African natives, method of treating, 502, 503
After-rains of Zanzibar and Uganda, 510
Agave fibre, 234, 577, 578, 719
Agricultural customs, Giryama, 105, 111; Watiku, 476
development of Zanzibar, and its needs (*see* Capital, Roads, *and* Scotch planters), 547—552, 561, 562; future, of Pemba, 611
implements, 43, 57, 334, 556
methods, native, 18, 22, 23, 43, 60, 77, in Zanzibar, 518, 519, 520, 523, 526, 529, 552, Swahili, 523; Arab, 523
products, 58—64; of the Wa-Giryama, 111, 112
seasons, 57, 58
Ahmed Bedwin, a hunter, 278, 296, 300
Akidi, native officer, 374
Al-Hathera, Arab name for Pemba Island, 588
Ali-bin-Issa, his sugar-mill, 519
Ali-bin-Jumah, the head-man, 35, 41, 42, 43, 52, 57, 65, 67, 69, 71, 72, 86, bad reports of, 156, 157, imprisoned, 176
Ali-bin-Salim, Liwali of Mombrui, 14, 17, his friendliness, 33, 36, 43, 54, 71, 72, 85, 86, 156, his project for a school, 300, interest in proposed Indian shops, 264, 304
Alimentary plants in Zanzibar, 548, 569
Allspice, *see* Pimento
Aloes (Furcræa *and* Sansevieria), distribution of, 4; used in rope-making, 93; 103, 119, 121, unused by Watoro, 123, 127, 132, 186, 187, 188; as fibre-producing plants, 230—236, 317, native names for, 321, a species described, 325, 326, 327, 330, 398, 399, 423, English firm about to work the fibre, 519, 545, in Zanzibar, 548, in Pemba, 599, report on values of, 624
Amadi-bin-Sultan Fuma Bakari Nabatian, descendant of former Sultan of Patta, 387, 388
Amadi Koropana, a bad character, 493
Amasha valley and spring, 288
Amboyna, clove culture in, 557, 562, 732—736
American aloes, in Zanzibar, 548
cotton for experimental culture, 41
drill used for tents, 457
rubber (*see* Ceará *and* Pará rubber, *and* Appendix D), soil suited for, 484; trees in South India, 701
system of cotton cultivation, 360, 361, 362, 363, 418
Amudu, head-man of Burkau, 465
Anglo-German treaty of 1888, advantages of, 508
Angola, 230
Animi (*Zanzibar copal*), 153
Ankoli, cattle plague in, 348
Anoko tribe, marriage customs of, 616
Anstruther, Keith, Superintendent of Melindi, 76, 87, his road, 90, 116, 117, toll desired, 118, 125, 136, 169, 179
Antelopes (*A. bubalis*), 78, 81, 84, 191, 298, 321, proof against tsetse-fly, 356




Digitized by Google

Antelopes (Dyke's), 303
Anthrax (*see also* Cattle disease), 348, 349
Anti-slavery decree of 1890, its effect on agriculture, 22, 207, 342, 539, 543, 549
Ants, a terror to cobras, 267
red, called 'siafu' 176, 177, 480, 484
white, 81, and mangrove wood, 221; 353, attack roots of clove trees, 558
Apes, legend of their origin, 107
Aphis, 638
Appendices: A. Further information respecting the Wa-Giryama, 615
B. Reports and Valuations on East African Products, 624
C. Meteorology of British East Africa, 656
D. Notes on American rubber-producing trees, 678
E. Extracts relating to Fibre plants, 707
F. Sir John's Kirk's Garden at Zanzibar, 726
G. The Clove Tree, 731
Arab, baths, 85
cultivation, 404, 567
cultivators, their difficulties, 22, 207, 238, 278, interest in the first plough, 309, 506, 594
dread of cattle plague, 23
hospitality, 88
hostile influence on the Watoro, 272
ladies in trouble, 175
manners and customs, 278, death custom, 525
of Muscat, runs amok, 175
settlers on east coast of Africa (*see* Patta), 443
shikaries (*see* Ahmed Bedwin)
slave caravan, effort to intercept, 157—174
and Swahili New Year, 14
weapons, 382
Arabia, 263, colonists from, 382
Arabs, or Swahilis, 11; dreaded, 84, and their runaway slaves, 121, 123, 158, 169, 195; their houses, 225; 267, relations with their slaves, 278, 281; on the march, 296, 299; good points in character of, 300
Arabs of Zanzibar and Pemba, a mixed race, 509, 510; cultivators, 519, 525, 526, 534, 539; their cocoa-nut growing, 523; death custom, 525; dwelling, 530; clove-growing, 553, 554; financial position of, in Pemba, 611
Arbagundi lake and village, 165, 166: village on fire, 171, 172, 318
Arbitration of author among Wanika labourers, 237, 238
Area affected by cattle disease, 347, 341
Area of the author's exploration, 1
Areca palms (*Areca catechu*), distribution of, 332, in Zanzibar, 516, 521, 530, 533, 534, 542, in Pemba, 593. *See also* Betel
Arnotto plant (*Bixa orellana*, L.), common in Zanzibar, 548, but not worth cultivating, 574
Aroboko, indiarubber at, 88, 150, 151, 153; slave settlement, 154, 156, 227
Arrack, 3
Arrows (*see also* Weapons) of the Pokomo, 334, broad-headed, of the Waboni, 481, poisoned, of the Waboni, etc., 336, 337, why marked, 338, poisoned, of the Wa-Giryama, not used in inter-tribal fights, 285, used by the Wa-Galla, 336, against the Somalis, 465
Arrow-root (*Tacca pinnatifida*, called 'uwanga'), 368, 369, 488, 518, 523, 571
Arura, 371, wild cotton of, 372
Ashakababo lake, 323, 324, described 326, 327, road to, 328, 329
Asiatics (*see* Arabs, Indians, *etc.*), in British East Africa, 616, 617
Askaris (soldiers) (*see* Selim, *and passim*)
Assam, shade-tree of (*Albizzia stipulata*), 580
Attack on Jelori and Melindi threatened, 177; but proves a false alarm, 183
Australian importation of silk-cotton, 569
salt-bush, 248
"she-oak" (*see* Casuarina)
silky oak (*Grevillea robusta*), a shade-tree, 563, 580
Author's illness, its cause, bad water, 306, 346, 383, 389, wettings, 460; 497, 499, 501, faithful nursing by Dumgu, 502; 503
Author's mission, its area, 1, scope, 12, and aim, 451
Avatula of Jongeni, a rebellious chief, 465, 492
Avocado pear (*Persea gratissima*, Gaertn.) in Zanzibar, 548
Ayesha bin Sofriani, wife of Nasur bin Suliman, and her allowance, 175

Digitized by Google

Ayubu and his caravan, 199, 200, 202
Azizi, officer of the Beluchi askaris, 185, 191, 199

B

Baazi, or pea (*Cajanus indicus*) (*see also* Peas), as a styptic, 518; 523, 525
Baba, a head-man, 87, useless, 93, 116, 155
Baboon, killed by leopard, 196
Baboons mistaken for lions, 305
Bagamoyo, cultivation of vanilla by French missionaries at, 595
Bahamas, Sisal hemp in, 576, 577
Bajimali, 383, products of, 385
Bajoni or Watiku (*see also* Guniahs), inhabitants of Faza and Patta, 73, 381; origin, weapons, and characteristics, 382, 383, 389, 393, 470; askaris, 382, 384, 386; chief, and distribution, 391, 394, 395, 399, 422, 425, 427; kill an English officer, 440, 461
Balé river, 103
Bambarra ground-nut (*Voandzeia subterranea*) in Zanzibar, 543, 548
Bamboos, 68
Bananas (*musa spp.*), distribution and cultivation of, 18, 40, 51, 57, 59, 65, 67, 68, 69, 88, 120, 122, 123, 137, 143, in Giryama, 102, 103; 204, uses, 220, 238, 248, 286, 328, 329, 330, 341, 369, 376, 401, 403, 404; in Zanzibar, 516, 517, 519, 525, 528, 533, 534, 535, 536, 540, 542, 544, 545, 548, an important product, 570, 571; fibre used in clove culture, 556; tree used for shade, 580; in Pemba, 590, 593, 598
Bandani village, 407
Banians (*see* Indians)
Bantu language in relation to Giryama and Swahili, 113
religion, 114
tribe, and cattle disease, 348
the, of Zanzibar, 510
Baobab (*Adansonia digitata*), distribution of, and uses, 2, 34, 74, 143, 144, 244, 341, 345, 354, 368, 370, 371, 377, 380, 394, 403, 405, 433, 456, in legend, 106
Baratarue lake, 221
Barbary beans (*see also* Beans), 255
Barghash, Seyd, *see* Seyd Barghash
Barley, red, experiments with, 255
Barley, report on, 653
Barometric determinations of height above sea-level, 221
Bazi, *see* Baazi
Beads as money, 337
Beans, 18, kunde beans, 48, 478; prices of, 63, 143; 64, 84, 87, 88, 94, 120, 122, 123, 136, 143, 144, 147, 149, 162, 328, 332, 333, 335, 341, 345, 354, 370, 377, 388, 405, 435, 474, 478, in Zanzibar, 548, 589
Bechai, a variety of Guinea corn, 477
Beehive huts of the Gallas, 336
Beer, Giryama method of making, 109
Beeswax, report on, 626
Beetles (*Heteronychus atratus*), inimical to sugar-cane, 569
Kandapauwa, and Kuruminiya, of Ceylon, inimical to coco-nuts, 565
Rhinoceros, 219, 565
Belesoni, or Belazoni, or M'Beledzoni, Canal, 4, 312, 332, 339, 340, 342, 366
Belozo or Muho village, 329
Beluchi soldiers, 183, 185
Benin, tsetse fly of, 357
Benoni-bin-Seyyid, Sultan, brother of present Sultan of Zanzibar, his shamba, 536
Beré Beré lake, 405
Berkeley, E. J., Administrator (now H. B. M.'s Commissioner in Uganda), 84, 128, 157, 169, 174, 175, 176, 201, 281, 282, 286, 295, goes to Uganda, 304, presentation to, 305
Betel (*Piper betel*, L.), in Zanzibar, 567
Betel nut palms (*Areca catechu*, L.); 40, 64, 68, 142, in Zanzibar, 520, 547, 566. *See also* Areca
Bikombe, the porter, 132, 133, 134, 137, 145
Bilati, 337
Bird-scarers, 475, 476, 479
Bird-Thompson (*see* Thompson, Bird-)
Birth customs and beliefs, of the Wa-Galla, 337, of the Wa-Giryama, 103, 105, 202, of the Wanika, 141
Blacksmiths' work of the Wa-Giryama, 97
Black snake (*see* Snakes)
*Blanche*, H.M.S., at Weti, 588
Blantyre, 233
Blue gum (*Eucalyptus globulus*), 545
Boase fibre, 233
Boma Upandi, 35, shamba, 35, 48, 70, Indian shops established at, 264, a stern husband at, 278
Bomani, 'mtaa' trees of, 370
Bomas, where used, 34
Bombay, Observatory, 512; trade with Zanzibar, 523, 524, 560, 561, 568
Bomzo swamp, 457

Digitized by Google

Bonde la Mwera Korokwe valley, 544
Bonde la Mzungo valley, 514, 543, 544
Books, delight of receiving, 169
Borabin or Burabin lake, 324, 330
Borassus palm (*B. flabelliformis*), distribution of, 288, 326, 373, 375, 384; in Pemba, 599
Bori harbour, 387
Borities, or wood of the mangrove, 81, 220, immune from white ants, 221; 298, 383, 384, 386, 387, 390; as fuel, 392; 397, 399
Borneo, tobacco cultivation in, 652, 653
Boundaries, 4
Bourbon, clove culture in, 523, introduced by the French, 553
Bowstring hemp (*Sansevieria*, sp.), 102, 229; notes on its uses and value, 233; Appendix E upon, 707
Bows and Arrows (*see* Arrows *and* Weapons)
Bracken fern, *see* Ferns
Bread-fruit (*Artocarpus incisa*, L.), 547
Brickdust, red (*ngeo*), as money, 537
Bridges, native, 51, 117, 376; over Mwera river, 535
Brinjal (*Solanum melongena*), 546
Brisbane, salt-bush seed from, 248
*Britannia*, P. & O. steamer, 503
British East Africa, its fibres, 233
British East Africa Company, repels Fumo Omari, 342
British Government, 506, its responsibility in the labour difficulty, 549, and duty, 551
British Museum, specimens of tsetse-fly in, 357
Bubashi, 465
Buffaloes, 81, affected by cattle disease, 84, 195, 299, 347, 348; on the Sabaki, 127, 187, 248; Galla method of killing, 336; proof against tsetse-fly, 356; 402, 403, 404, 476, 486, 501
Bullock-hackeries introduced, 347
Bullocks, cost, food, and qualities of those of the coast, 213; in Zanzibar, 574
Bura, a Pokomo village, 330
Burabin, *see* Golbanti; lake, 324, 330
Buramanza hill, 456, 457, 461, 462, 465
Burkau (*see also* Port Durnford), 446, village, 448, 449; delays at, 451; country near, 452, 454, guide from, useless, 459; return to, 460, 461; more delays, 462, 471; Wa-Galla near, 464, their head-man, 465, 472; ruins near, 462, 465; cultivation and villages near, 466, 467, 469, 470, 471, Fumo Omari's influence paramount, 472; forest near, 407
Burt, Rev. F., C.M.S., 90, 177, 178, 180, 183, 242, 274, 282, 285
Bush districts, general aspect of, 81, 83, 89, 117, 126, 127, 128, 132, 167, *passim*
Bwana Siri, a Bajoni hunter, 398, 399, 429, 435, 439, 441, 442, 445, useless as a guide, 458, 459, 460, 461, 462, 469, 476, dismissed, 471, 478

C

Cacao (*Theobroma*, L.) (*see* Madre de Cacao), yield and suitability, 229; in Zanzibar, at Mbweni, 545, 548; 576; Hart on, 578; Morris on, 580; best quality from Ceylon, 579, 581
Cacti, distribution of, 4, 93, 117, 119, 126, 127, 128, 132, 133, 186, 187, 335
Calaba (*Calophyllum calaba*), shelter-tree, 563
Camel, the, load for, 17; used to drive seed mills, 63; cost to hire, 67
Camel-transport, 263, arrangement, cost and food of animals, 264
Cameron, Commander Lovett, his remarks on wild nutmegs, 229
Camp in shamba, an offence against Watiku customs, 476
Campbell, Capt., of H.M.S. *Philomel*, 304
Candelabra tree (*see* Euphorbia), 322, 484
Canoe-building district near Ndera, 334
Canoes, or mows, of the Wa-Pokomo, 323, 329, 340
Cape of Good Hope, cattle disease at, 347; distance from Zanzibar, 508
Capital endangered by labour difficulties, 549, needed for their solution, 550, 551
Capsicums, *see* Chillies *and* Pepper
Caravan work liked by natives, 34
Caravan, to be intercepted, 157
Caravan, *personnel* of, 416
Cashew nut (*Anacardium occidentale*), 248, 370, 384, 547
Cassava, or Manioc (bitter kind, *Manihot utilissima*, sweet kind, *Manihot aipi*), distribution and cultivation, 35, 39, 59, 63, 88, 137, 140, 144, 147, habits resembling those of Ceará, 228, 248, 335, 370; in Zanzibar, 515, 517, 518, 519, 520, 523, 524, 525, 528, 533; in clove nurseries, 539.

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542, 543, 548, 557, 571; an exhausting crop, 572; in Pemba, 589, 593, 594, 597, 603, 604, 605
Castilloa rubber (*see* Central American rubber tree)
Castor-oil plant (*Ricinus communis*), distribution, 47, little used, 64; 98, 117, 127, 136, 137, 144; wild, 196, 229, 368, 435; experimental culture, 248, 272, propagation, 272; 287, 371, 383, 433; in Zanzibar, 548; native names for, 618
Castor-oil seed, 272, report on, 626
Casuarina trees (*Casuarina littorea*), distribution and value of, 2, 82, 83; identical with Australian she-oak, 221; 458, theory as to propagation, 470; a shelter-tree, 563
Caterpillar which attacks clove trees, 558; which attacks cotton (*Aletia argillacea*, Hübn.), 638
Cattle disease, affecting game (*see* Buffaloes, Deer, Giraffes, *etc.*), 195, 269
  periodical, 23, its causes, 213, 330, 349, radius, and cure, 347, symptoms and effects on native population, 344, 347, 349, one good result, 356
Cattle, experimental herd desired, 210; points of importance concerning, 210, 211
  and the Ganda or tsetse-fly, 356, 358, 419, 432, 434
  given for wives by the Wa-Galla, 338
  required for draught in Zanzibar, 551
  scarce, 136, 381, 449
Cattle-trade of Kionga, 437
Cayenne pepper (*see* Chillies), sources of, 573
Ceará rubber tree (*Manihot glaziovii*), its suitability to East Africa, 226, 227, and to West Africa, 228, 255; at Mbweni, 546, 548, 584; Appendix D upon, 689, 702
Celadon china on mosques and tombs, 443
Centipedes, 184
Central Africa, nutmeg groves in, 229
Central agricultural experimental station proposed (*see* Experimental culture, Jelori, Mbweni, *etc.*), 273
Central American rubber tree (*Castilloa elastica*), suitability to East Africa, 149, 226, 227, its yield and suitability to India, 703
Central Giryama, 100, districts, 101
*Cerbera manghas*, a shelter-tree, 563
Ceylon, agricultural example of, 208, bullock hackeries of, suited to East Africa, 347, cacao of, 579, cacao seeds from, 581; murrain in, 213; Ceará rubber obtainable from, 228; coco-nut culture, beetle inimical to, 565, proverb concerning, 214; fibre plants of, Appendix E, 716; guinea grass of, 354; native gardener desired from, 272; pimento in, 582, salt bush indigenous to, 248, silk-cotton of, 569, silky oak of, 563; meteorological observations at, 579
Chakamba lake, 359
Chaki-Chaki, 588, rainfall of, 593; 599; crop of cloves in 1891, 607; coco-nuts of, 608
Chameleon, in Giryama folklore, and parallel, 107, 108
Chara, salt trade of, 331, inhabitants of, 332, 344
Charm to keep out snakes, 196
Chatturo, 332
Chemchem, source of Zanzibar water supply, 513
Chibeku, oil mills at, 63
Chilani stream, 288
Child-exposure, 203, 337
Chillies, or Capsicums (*Capsicum annuum*, and *Capsicum frutescens*), 40, 136, 341, in Zanzibar, 539, varieties of, 540, 547, culture declining, and why, 573, experiment in 1895, 574
China, pineapple fibre from, 578
China grass, *see* Ramie
Chinese cassia (*Cinnamomum cassia*, Bl.), in Zanzibar, 548
Chiromo, fibre experiments at, 234
Chosini Shamba, Pemba, cultivation at, 590, 491, 606
Christian natives, 90, 98
Christmas Day diversions, 195; at Mombasa, 305
Chuaka, road near, 561
Chueni, palace in Zanzibar, 514, described, 515, plantation at, 516, possibilities of, region, 517, 524, methods of cultivation, 518, 519, 558; aspect of country thence to Kokotoni, 520; suited for betel-nut culture, 567
Church Missionary Stations (*see* Burt, Edwards, Hooper, Jones, Tucker), Freretown, 285; Jelori, 90, 92, 98; Kamlikeni, 100; Kisulutini, 99; Mwaeba's Hill, 100; Rabai, water supply at, 287; undesirable settlers near, 271

Digitized by Google

Chuyu, meteorological observations at, rain, 8, temperature, 101, wind 9, 659
Cinchona plantations in Madras, deductions from, 227
Cinnamon tree (*Cinnamomum zeylanicum*), cuttings planted at Magarini, 25, 255; grown at Mbweni, 548; suited to soil of Zanzibar, 581; large trees in Pemba, 600, 602, 605
Circumcision cycles, Giryama, 108
Citron in Zanzibar, 568
Citrus (*see* Orange, Sweet Lime, *etc.*), cultivation of, 64, 154, varieties of, in Zanzibar, 547, grow well when cared for, 567, 568
Civilizing agency of native Christians, 98
Clay soil best for clove-growing, 525, 526, 528, 534, 553
Cleared land, ownership of, 34
Climatology of East Africa, Appendix C, 4th Report of British Association for the Advancement of Science, 656; 5th Report, 664; 6th Report, 670
Cloth used as money, 337
Clove trade of the middle ages, 732
Clove trees (*Caryophyllus aromaticus*, L., or *Eugenia caryophyllata*), in Zanzibar, 507, 515, 516, 517, how cultivated, 518, 519, 520, at Kokotoni, 521, 524, 528; coco-nuts planted amongst, and why, 523, 524, 528, 530, 557; soil suited for, 525, 526, 528, 534, 553; Dunga and district, 525, 538, 539, 542, 543; care required in culture, 526; 529, 530, 533, 534, 535; average life of tree, 535, effects of presence of ilook, 536; none grown at Jumbvi, 543; in Mwera district, 544; a chief commercial product, 547, lack of care in culture, 548; the chief object of culture in Zanzibar, 549, 552, 553; original habitat, 553; introduction into Zanzibar, 553, 554; effects of the hurricane of 1872, 555, 561; Swahili name, 554; methods of cultivating, nurseries, size of beds and watering, 554, hardening, lining, holing, and planting, 555, 556, prices of seeds and plants, 555, weeding and after-cultivation, 556, 557, diseases, enemies, etc., 557, 558, time of bearing and yield, 558, 560, colour of buds, and gathering, 558, curing, and price of hired labour; clove stems, disposal of the crop, value, and duty, 559; comparison between cloves of Zanzibar and those of Pemba, 559, 560, 607, 608; mode of shipment, 560; clove stalks, export table, 560, revenue from, in Zanzibar and Pemba, 561; price in London, 1896, 562; various methods of drying, 562; suggestions for improved culture, 563, in combination with cacao, 580; culture in Pemba Island, 586, 588, 589, 590, 591, yield, 592, 593, 594, Arabs consider Pemba better suited for their growth than Zanzibar, 595; 598, 599, 600, 601, 602, 603, 604, 605, chief points connected with culture, 606, Pemba cloves at present inferior to those of Zanzibar, 607, 608
Clove tree, Appendix G upon, 731, habitat, varieties, and distribution, 732, culture in various places, 733–735
Coast-lands of British East Africa, 1, denuded of wood, 81, the rubber area, 150, and varieties of rubber in, 152; capabilities and value of, 204; suggestions for developing, 204–221; products of, to be cultivated, 272
Cobra, *see* Snakes
Cochin copra (*see* Copra), 260
"Cock-fighting," 82
Coco de Mer (*Lodoicea*), 545
Cocoa cultivation in Trinidad (*see* Cacao), 551
Coco-nut trees (*Cocos nucifera*) (*see* Coir, Copra, Toddy, *etc.*), distribution and cultivation, 15, 16, 17, yield, 34, 40, 48, 51, 57, 58, 59, 238; price per thousand nuts, 59; prices, local, 143, 148; 65, 68, 69, 87, 102, 138, invalid trees, 142, 143, 147, 432, 435; care required by, 142, 145–148, 208; at Aroboko, 154; 155, 204, 210, notes and proposals concerning, 213, 214; brackish milk, 219, cured by drainage, 220; will not thrive in inland salt soil, 247, but like to grow in creeks, 407, 422, 425, 426, 523; 248, 249, experimental culture proposed, 272; 274, 281, 285, 286, 287, 288, nursery at Magarini, 306; 341, 344, 345, 352, 354, 355, 359, 366, 367, 369, 375, 376, 377, 379, 380; in Patta, 382, 384, 385, largely grown near Siyu, 386, 387, 388, 389, 391, 392, none at Mgini, 403, few at Masagoni, 405, at Mkauoni, 418, importance of cultivating, 419; bush soil suited for, 426; 436, 438, cut down as punishment at Kiongawana Island, 440; water-borne nuts, 470;

Digitized by Google

at Kionga, 472; in Zanzibar, *versus* ploughs, 506; 515, 516, 517, near Chueni, 518, 520, at Kokotoni, 521, why planted amongst cloves, 523, 524, bad results to themselves, 528, 530, 557; same custom in Pemba, 591, 592, 603; near Dunga, 525, 526, 557, in Kokotoni district, 526–530, 533; near Mdo, 534, 535, 536, 540–544; a chief commercial product of Zanzibar, 547, 552, chief facts regarding, 564; on Pemba Island, 593, 594, 595, 597, 598, 604, 609; report on cultivation at Magarini, 633

Coco-nut gathering, 71, 260
husks wasted, 17, 59, 214, 598
matting, 539
oil, 59; note on, 260, 519
uses made of, for beer, 102, for food, 316, for roofing, 142, 353, 380, 382, 441

Coco-nut, the Pemba or dwarf species, 88, 149, 565, 591

Coffee (*Coffea Arabica* and *Liberica*, called also 'Cassenga'), wild, 334, beans, chewed by Bajoni, 382, Liberian species diseased at Mbweni, 545; coffee growing in Nyasaland successful, 551, in Pemba, 595, in Uganda, 654, in Zanzibar, 548, 568; extension of growing, to Taita, 736; reports on coffee from British East Africa, 627, 628, on coffee from Uganda, 654

Coir rope, 58, 214, 380, method of manufacture, 381, prices, 381, 383, advice to natives on, 386, 388, 400; in Zanzibar, 518, 519, 524; used for shoes, 540; 565; report on the industry in British East Africa, 629, expert's suggestions on manufacture, 630, the industry on the west coast of Southern India, 630

Colombo, murrain in, 313, rainfall at, 579

Commercial products of Zanzibar and Pemba, 547, 575, Appendix B, 624

Communication (*see* Bullock hackeries, Draught-animals, *and* Roads), facilities for, necessary, 89, present means of, 551, 566

Comoro Islands, and Islanders, 214, in Zanzibar, 510, coir manufacturers, 518; 524, coir of, 565

Congo pea (*Cajanus indicus*) (*see* Baazi *and* Peas), 64, 143, 517, use of its leaves, 518; 548, 589, 598

Congo State, and cattle disease, 348, tsetse-fly in, 357

Consul-General at Zanzibar (*see* Portal, Sir Gerald)

Coolies from Kurachi, 85, 89; required in British East Africa, 208, 209

Copal (*see* Gum Copal)

Copra, 59, 214, its value and uses, 260, transit and packing of, 263; from Rabai, 288; 381; advice concerning, 386; 388; of Pemba Island, 587; preparation of, 608, 609; report on that from Magarini, 632; of Zanzibar, 518, 564, 632

Coral, of the coast-line, 82; islets, 441, 442, 443, 445, 448, 507; rocks and uses, 143, 149, 281, 358, 368, 369, 380, 384, 386, 387, 388, 392, 433, 441, 518, 526, 527, 529, 533, near and at Dunga, 537, 538, 539, 540, the Limani rock, 541; 542, 543; at mouth of Mwera river, 544, in the West Indies and Zanzibar, 577, in Pemba, 588, scarce, 602

Cotton (*Gossypium spp.*), and cotton-growing
at Magarini, 24, 40, 57, 67, 71, 237, Sea Island and New Orleans seed planted, etc., 256, value of, 259; 264, experimental culture proposed, 272; 306, manufactured, 309; report on, 637
Herr Tost's plantation, 360, methods pursued, 361–363, results, 364; Herr Tiede's plantations, crop, and quality, 364, 365
near Itembe, 392, at Mattaroni, 393, price, 394, method pursued, 395, 396, value, 397; 399, crops at M'Kauoni, 418
Native and wild cotton, distribution and cultivation, 147, 210, 371, 372, at M'Tapa, 421, near Shwe, 431, 432, at Rubu, 435, at Kionga, 441, not grown at Burkau, soil suitable, 466
in Zanzibar, 548, not a suitable crop, 569
reports on, 634, 635, 637, table of valuation, 636–640
a suitable crop, 15, 41, 48, 98, 166, 210, 238, 466

Cotton-seed, for experimental culture, 13, 256; used as fodder, 209; syndicate desirable for distributing, 419; report on, 641

Cow-dung as cure for tsetse-fly bite, 357

Cowrie shells at Kionga, 439, 441

Creation myth in Giryama, 103

Digitized by Google

Crocodiles, 17, 86, audacity of, 91, 98, 99, 344; 93, 120, 129, 169, 170, 171, 172, 173, impede transit, 260, 304, pleasure in shooting, 273, Pokomo hunters of, 324, 334; in the Ozi river, 344, none in Beré-Beré lake, 405, in Tana river, 426, none in the Dodori river, 490, 493
Crops, rotation of, at Melindi, 15
Croton plants in Zanzibar, 507, 546
Croup personified, 108
Cucurbit (*Telfairia occidentalis*, or 'M'bone'), uses of, 518, in Zanzibar, 548
Cudrania, a dye wood, 728
Cultivation (*see* Agricultural Customs *and* Routes marched), on Suliman's shambas, 40, 63, between Magarini and Melindi, 44–48, between Gongoni and Mombrui, 84, in the Giryama country, 87 *et seq.*
on Pemba Island, 589–605, chief points connected with, summarized, 606–611
on Zanzibar Island, 518, 519, 520, Mr. Fraser's experiments at Kokotoni, 521; condition near Kokotoni, 527–530, near Mdo, 534–537, at Dunga, 538, 539, in the Wahadinu districts, 540, 541, at Jumbvi and Jonga, 542, at Mwera, 543, at Kikokani, 544, at Mbweni, 545, 546, summary of author's observations on cultivation in Zanzibar, 547–560, 563; coco-nuts, 564, 565, betel, 566, 567, mango and jack, 567, bananas, 570, cassava, arrowroot and grains, 571
Cultivation of cocoa, notes on, 587, 581
Cultivation and slavery, 22, 207, 297, 342, 485, 609, 610
Currency of East Africa (*see* Money), 523
Custard apples, 40, 70, in Zanzibar, 547
Custom houses of B. E. A. Co., 146, 251, 281
Customs, *see* Duty *and* Revenue
Cycad, a kind called *Makumwa*, 89, other kinds, 103, 282, 288

D

DAGAR river, no traces to be found of it, 317
Dagoreti, Lugard's stockade at, 121
Dances of the Wa-Giryama, 110, 180; of the Watiku, 427; of the Watoro, 267; a devil dance, 285
Dari (Metamah *or* millet), valuation of, 641
Date palms, 24, fruit used as camel food, 264; 345, 366; in Zanzibar, 507, 547
Death and funeral customs, and beliefs, Arab, 525; Swahili, 243, 244; of the Wa-Galla, 337; of the Wa-Giryama, 104, 105, 107, 113; of the Wa-Pokomo, 333; of the Watoro, 243
Death, Origin of, Giryama legend, 107
Debwane cloth, 491
Deer destroyed by cattle plague, 347
Demonology of the Wa-Giryama, 104, 108
Denhardt, Herr C., his cotton and coco-nut plantations at Wange, 401, 417, 418
Dewfall and crops, 101
Dhurra (*see* Dari, Millet, *etc.*), 255
"Dia Kuu," or "big path," *i.e.* road, 478
"Dick's Head," or Ras Kiambone, headland, 442
Digo or Wa-Digo tribe, and settlements, 102, 103, 207
Dindigul, tobacco labourers of, 209
Dinner in the bush, 129
Discomforts of African travel and illness, 187, 247, 253, 305
Diseases met and dealt with, 42, 43, 53, 54, 57, 123, 199, 238, 243, 382, 389
*Distomum* worm in sheep, cured by salt-bush feed, 248
Divination in Giryama, 106
Dodori creek, 421, 422, 496, and village, 423, 424, 425, river, 427, 490, 493, 494, 497
Dogs, Guniah, 74
wild, their ferocity, 412, 453, attack porters, 498, 499
Dollar, its equivalent in rupees, 17; its fixed value on east coast of Africa, 523
Domestic animals in Zanzibar (*see also* Bullocks, Camels, Donkeys, Goats), 574, 575
Dominica, clove culture in, 734
Dongi Hill and district, 520, 521
Donkeys, cost of, 17, 264, for the plough, 23, 209, for draught, 41, 144, comparatively immune from tsetse-fly poison, 358, 432; 376, 419, used in Zanzibar, 575
Drainage, 57, 220, not practised in Pemba, 604, 606
Draught animals (*see* Bullocks, Camels, Donkeys), required, 23, 41, 209, 213, in Zanzibar, 531

Digitized by Google

Drums, sacred, 106, 110; as dance music, 275, 427
Dum palm (*Hyphæne thebaica*), 3, appearance and uses, 47, 263, near Sabaki, 187; 322, near the Tana, 325, 326, 340
Dumgu, a faithful head-man, 296, 310, 416, 451, his information on the Burkau district, 463, 479; kills a snake, 468; 494, 501, his unselfish loyalty, 502
Dundas, Commander L. G., R.N., his journey up the Tana and Juba rivers, 4, 5, 331, 339
Dunga, 514, hill, 537, described, 538, 539; aspect of surroundings, 540, 541, 542
Dungi, 524, clove plantations at, 530
Durian (*Durio zibethinus*, D.C.), in Zanzibar, 548
Dutch clove cultivation and present practices, 523
Duty on cloves at Zanzibar, 559
Dwarf palms, *see* Fan palm, Pemba palm
Dwarf race of the interior, 615
Dwellings, native, Waboni, 335, Wa-Galla, 336, Wanika (ill), 452, Wasania, 155
Dye-yielding plants (*see* Arnotto, Henna, Indigo, Logwood, Orchella, *and* Turmeric), of Zanzibar, 548
Dyke's Antelope, called *Dendara*, 303
Dysentery, 43, 54, 123, 199

E

EAST AFRICA, needs of, 550, 551, 562
Ebony trees, distribution of, 353, 358, 397, 493, 498, report on, 641
Ediens, Indian cattle-keeping caste, 208, 209
Edison, Prof., new method devised by, for decorticating pineapple fibre, 578
Edwards, Dr., of the C.M.S., 305, 306
Egypt, 295, cattle plague on its borders, 348
Egyptian cotton, suitable for East African cultivation, 166, 272, 274; seed tried at M'Kauoni, 418
Elephants, near Gongeni, 84, tracks near stockades, 191, 195; 296, near Lake Krawa, 298, 299, 303, 398, a hunter's life, 398; near M'Gini, 404, near Dodori, 423, 425, 426, a watering place for hunters, 442, 444; tracks near Kinawi, 453, 454, camping place of hunters, 455, landmark of, 456, 457, 460, Wa-Galla method of killing, 465, 466, tusks claimed by Wa-Galla, 466; 468, by Watiku, 482, 487, by Fumo Omari, 476, 491, 492
Emin Pasha, 295, on the causes of cattle disease, 349
Endurance of porters, unequalled, 502
Engatana, 352
Euphorbia, distribution and uses, 4, 78, 102, 314, 322, 484, 485
Europeans trusted by Watoro, 242
Expedition, of 1891, under Capt. Dundas, R.N., up the Tana; notes by Mr. Bird-Thompson, 331
Expeditions, *see* Routes marched
Experimental culture (*see* Kirk, Sir John, Mbweni, *etc.*), planned, 41, 48, 68, 69, 90, 97, 98, 122, 149, 166, 209, 210, 221, 226–236, 237, 238, its success, 256, 257, 259, details of proposed nursery at Jelori, 272; vanilla and coffee culture of French missionaries, 595, 730
Exports of coffee from British dependencies, 628
Exports: cloves, 554, 560; coco-nuts, 523, coir, etc., 524, copal, 154, copra, etc., 260, 518, 523, 532; cotton, 364, 365, 394; india-rubber, 152, 228; mangrove, timber, 81; mat-bags, 380; millet, 60; orchella weed, 83; toddy of Siyu, 386
possible, bye-products of the coco-nut, 214, 260, fibres, 230, produce, 298
of Zanzibar and Pemba, betel, 567; chillies, 573, 574; cloves, 560, 561, 562; coco-nuts, 564, coir, 565, copra, 565; ground nuts, 572; sisal hemp, 577; proposed, of oranges, 568

F

FALSE alarm at Jelori, 177–183
Fan palms (*Hyphæne sp.*), distribution and uses, 78, 142, 250, 263, 287, 310, 313, 317, 353, 354, 355, 358, 360, 368, 370, 373, 375, 380, 381, 384, 385, 387, 388, 391, 392, 399, 401, 402, 404, 405, 407, 408, 422, 426, 431, 500
Fan, Mr. Weaver's dog, its death, 199
*Fawn*, the, a vessel, 5
Faza or Paza, in Patta Island, 380, origin of its inhabitants, 381, 382; 383, 388, meteorological observations at, 389; 427, 429, 492
Fazi Island, 390, 391, 401

Digitized by Google

Feeding of cattle, its great importance, 201, 213
Fern, Bracken and other, 537, 541, 597, 598, 600, 604
Ferry over Ozi river, 408, over Tana, 408, needed for Sabaki, 222, suggested improvements in existing, 225
Fertility of Zanzibar Island, 509, 518, 528, 533, 543, 549, 551, 552
Fibre-yielding plants (*see* Banana, Bowstring Hemp, Coco-nut, Furcroya, Jute, Ramie, Pine-apple, Sansevieria, *and* Fan Palm), distribution of, 4, 229–236, where best grown, 313, uses, 353; report on, 624
of Zanzibar, 548, 571, suited to that place, 576, 577, 578, Appendix B., 625
Fibre-yielding plants discussed, Appendix E., 707
Fig-trees (*Ficus spp.*), 40, in Zanzibar, 507, the common fig, 547
Fiji, imports of silk-cotton, 569, temperature of, 513
Financial positon of Arab cultivation in Pemba, 611
Fire-boundary round shamba, 264
Fire- *v.* sun-drying of copra, 608, 609
Fire, method of extinguishing, 172
Fires, annual, to clear the ground, 398, 487, 488
Firewood, whence obtained, 81, 84, 392
Fish, Guniah methods of killing, 78; killed by dynamite cartridges, 183; plentiful in Patta, 383
'Fisi,' or totem of the Wa-Giryama, 107
Fleas, 372
Flies, 195
Floats of timber possible on the Sabaki river, 225
Foaker, Mr., his journey, 194, and rhinoceros adventure, 195
Folklore (*see* Birth customs, Death and Funeral customs, Marriage customs, Witchcraft, *etc.*), of the Wa-Galla, 337, 338; of the Wa-Giryama, 110–113, 202; of the Watiku, 476; of the Watoro, 243, 244; of the Zulus, 107
Food staples, 59, 63, 122
Foreign trees and plants in Zanzibar, 548
Forest area, 150, 466
Forests of the Sabaki, their value, 120, 126, 204, 225; near N'Zovoni river, 288, near Roka, 291; 325, of Utwani, 350, 352, 353, 354, 355; tsetse-fly in, 356; 358, near Dodori, 427
Formosa Bay, 4
Fort Smith, meteorological observations at, 661, 666
Fourcroya, *see* Furcræa, fibre plant, 234
Fowls, price for, in Wakamba, 162
France, *see* Marseilles
Fraser, Mr., his cultivation at Kokotoni, 521, 522, 524, 569
Frasila, weight, equivalent in lbs., 263, 264, at Bombay, 524, in Zanzibar, 535
Free labour (*see* Hired *and* Imported, *also* Labour), scanty in Zanzibar, 549
Free Methodist Missionary Society's head-quarters at Golbanti, 323, 332
Freemantle, Vice-Admiral Sir E., at Port Reitz, 7
Freemasonry of the Wa-Giryama, 107
French introduction of clove culture to Bourbon, 553, 557; method of clove culture, 523, 557
French missionaries and coffee culture, 730, and vanilla culture, 595
Frere Town C.M.S. station, 285, 286, 287
Frohawk, Capt., of the B. I. S. N. ss. *Java*, 503
Fruits of the coast-lands, 64, of Giryama, 102, of Zanzibar, 547, region well suited to, 567
Fuel (*see* Firewood)
Fuladoyo, 102, 103, slave settlement at, 130; 134, cultivation at, 136, 137, 145, 184, 195, river near, 282
Fumo Omari, rebel Sultan of Witu, 86, 177, 331, 342, 344, 346, 350, his head-quarters, 351, 352, why outlawed, 353, 373, 375, 393, results of his actions, 403, 465, felt by expedition, 491, 494, 495, 496, 497, final attack on, 501, successful, 502
Fundisha, shambas, and their water supply, 313
Fungo Zombo, 351, 355, its fine mango trees, 371
Fuoni district, cultivation in, 544
*Furcræa* (*see* Aloes, Fibre-yielding plants, *and* Fourcroya)
*cubesisi*, 718, 719
*gigantea*, or Mauritius hemp, thriving in Zanzibar, 549

G

GADFLIES (*Tabanus latipes*, Macq.), 357, 424
Gall-sickness in cattle, 347
Galla country, 12, and villages, 165, 166, 487, 490
Galla or Wa-Galla (*see* Golbanti),

Digitized by Google

feared by the Wanika, 87, and Watoro, 123, *etc.*, 429; disturb cultivators, 89, in Giryama, 101, 103, 154, collectors of edible water-lily seeds, 118, 119, on the Sabaki, 127, narrow-headed, 129; their weapons, 129, 151, 177, 299; slave-trading by, 131; diet, 169; 172, 177, "slaves of the Somalis," 273; a traveller's outfit, 299; former settlements, and powers of endurance, 318; villages of, 322, 337, settlements, 323, 327; name for swamp near Golbanti, 324, 325, name for n'konge aloe, 327; oppression by, 328, 333, 456, 466, oppressed by raiders, 335, 398; cattle scarce amongst, 330, destroyed by the disease, 344; their servants, the Waboni, 335, 336; birth, manhood and death customs, 337, idea of God, 337, marriage customs, 337, 338, ornaments, weapons and food, 338, love of toddy, 352, precautions against tsetse-fly, 356, invasion of the coast, 382; trade of, 435, 466, incited against the author's party, 446, shauri with, 451, gifts to, 452, feared by Burkau folk, 462; 463, why, 464, 466; of the Wiori river, 464; origin, wars, etc., 465; 487

Galmo, Galla head-man at Wiori, 465

Gama, Vasco da, his Pillar, 16

Gambia, rainfall of, 227, Ceará rubber of, 228

Game (*see* Antelopes, Giraffes, Hartebeest, Kudu, Lions, *etc.*) at Marereni, 81, 84; 128, 187; scarce near stockade, 2, 191, plentiful along Sabaki, 195; near Lake Krawa, 296, 298, 304, 321; in relation to health of cattle, 349, 350; near Shaka, 365, near M'Kumbi, 373, near Itembe, 392, near Juba river, 398, near M'gini, 404, near Dodori, 423, 424, near Kave, 486, near Mundane Hills, 408; 500

Games at Ras N'Gomani, 82

Ganda, the Galla name for the tsetse-fly, 356, 419, 432, 434

Gararen forest, rubber of, 497

Geological formation of the Sabaki river-bed and area, 120, 188, 221, 227

Geological formation of the soil at Shaka, 371

German East Africa, boundary, 4

German cession of Witu to Britain, 353

German cultivators (*see* Denhardt, Küntzel, Tiede, Toeppen, Tost, *etc.*), 259, 352, 355

German mission at Ngao, 327, health of place, 328, 332

German subjects murdered by Fumo Omari, 177, avenged, 353

Gingelly (*Sesame* or *Simsim*), 15, in Zanzibar, 572

oil, source, 60, and uses, 63

Ginger (*Zingiber officinalis*), suited to Zanzibar, 583, West Indian method of cultivating, 583

"Ginger-bread palm," 3

Giraffes destroyed by cattle disease, 299; 398

Giryama country or U-Giryama, 2, 3, 87, 125, 133, 148, 165; agricultural seasons, 92, 111–113, 137; position and divisions, 99, 100–103, water supplies, 100, 101, 103, fertility, 101, 102, 103, agricultural customs, 105, 111, 112; soil suited to Castilloa, 227; river in, 282; trade route through, 286; 287, means suggested for opening up, 288

Giryama, the, or Wa-Giryama, 90, wages paid to, by mission, 91, employed by mission, 272, cultivation by, 92, 93, 94, chief products, 136, 193, 229, 236, 288, 291, new products introduced, 259; *shauri* on objects of author's visit, 97; characteristics of the race, 97, its importance, 97; language, 101, in relation to Swahili, 113, religion, 103, divination amongst, 106, idea on man's early state, 106, idea on Origin of Death, 107, demonology of, 105, circumcision cycles, 108, freemasonry amongst, 108–111, division of time, 111, marriage customs and inheritance, 113; significance of a clearing on the Sabaki, 127, curiosity at dinner and toilet of author, 134, 135; scarcity of cattle, 136, density of population, 136, 137; trade staples with M'Tangamika, 138, 144; price for copal, low, 154, in relation to the Wa-Kamba, 162; 171, 172, weapons, 177, 180; author's alliance with, 180; 183; a birth custom, 202; distrust of the Liwalis, 202; chief trade outlets, 229, interest in experimental culture, 259, 274; quarrels and amends, 285, 287; tribal divisions, 616, tribes and races known to, 616, 617, trees and plants amongst, 617

Gisla, its equivalent in lbs., 60

Gnats, 392

Digitized by Google

Goanese half-castes in Zanzibar, 510
Goat killed by python, 267
Goats, milch, herds of, 74; 133, 136, 137, 169, 323, 368, houses for, at Sivatoni, 371, 405, 432, 435; 449, prices of, at Kionga, 472; in Zanzibar, 575
Goat-weed, 18
God, Galla idea of, 337; Giryama ideas on, 103, his forgetfulness ensures life, 105
God's "hen and chickens," 103, in connection with death, 104
Golbanti or Burabin, 310, 318, 322, a Galla settlement on the Tana, 323, situation of, 324, temperature, 325; 326, 327, 329, 330, 339, 351
Gomani Bay, 5
Gome la Hekwa, or Sherwood Point, 444, 446, 468, 469
Gomo, a Waboni head-man, 482, 486, his brother, 487; 489, 491, 493
Gongoni, 69, expedition to, 73, appearance and inhabitants, also water supply, 74, situation, 77, salt deposits, 78; 81, 147, coco-nut cultivation, 214, Guniah mat-makers at, 263; 296, 310, 313, 412
Gongora, 146
Gosha, a runaway-slave settlement, 407
*Gossypium spp.* (*see* Cotton), 144, 548
*arboreum*, 147
*barbadense*, 147
Government among the Wa-Gallas, 337, among the Wa-Pokomo, 334
Grains of the coast-lands, 59, 60, 63, 64; of Zanzibar, 548, 571
Grass used for thatching, 90; "killing the road," 127
Greenwich, meteorological table of rain, temperature, etc., 10
Ground nuts (*Arachis hypogea*), suitability of, to country, 213, seed planted, 259; 272, 425, 426, 436, 478, 524; 542; varieties of, 543; 544
(*Voandzeia subterranea*), or Bambarra ground-nut, 543, 548, in India, 572
report on, 642
Guavas, 70, in Zanzibar, 547
Gudaki, Watiku village, 466
Guide from Burkau (*see* Bwana Siri), promised, 450, 451, 452, 453, his ignorance, 458, 459, 460, and uselessness, 460, 462, 478, a new guide, 463, guides from Kave, 489, malingering, 496
Guinea corn (*Sorghum vulgare*), 15, diseased, 18; 34, 40, the Bechai kind, 477; 523
Guinea-grass, 82, 177, indicates a rich soil, 136, 142, 287, 354, 368, 435; 137, 140, 147, 155, as fodder, 209, 210; 474
of Ceylon, 354
Gum-Arabic, report on, 641
Gum-copal, called *Animi* in Zanzibar (*Trachylobium hornemannianum*, H.), trees, 88, 89, trade in, 138; 143, 144, described, 153, methods of collection, 154; report on, 642
Guniahs (*see also* Bajoni *and* Watiku), location, 73, cultivation, 74, animals, 74, characteristics, 77, a telephone amongst, 77, boatmen of Ras N'Gomani, 81, 82, orchella gatherers, 83, rubber collectors, 151, mat-bag makers, 259, 381
Gunny-bags, cost of, etc., 263; as opposed to makandas for clove-packing, 560
Gururu Lake, 324

## H

HADRAMAUT, Arabs of, in Zanzibar, 510
Hamburg, trade with Zanzibar, 561, and possible increase, 632
Hameye, 337
Hannington, Bishop, murder of, 605
Haramele-bin-Saleh introduces clove culture to Zanzibar, 554
Harbours, 1, 4, 5, 386, 387, 507
Hartebeest (*Alcephali*), 298
Hatch, General, 304
Havana tobacco-seed, suited to East Africa, 418
Hawazaon, her death and alleged bewitchment, 243
*Hemeleia vastatrix*, or leaf disease, 568
Hemp, *see* Bowstring hemp, Fibre-producing plants, Pineapple, *and* Sansevieria, Sisal, *etc.*
Henequen, *see* Sisal hemp, *also* Appendix E
Henna plant in Zanzibar, 548
*Henry Wright*, coasting steamer, 13, 14, 86, 146
Heron, 44
Hindi, 370, 371, 405
Hindoo peasant, his industry and thrift, 23
Hippopotami, distribution of, 24, 47, 51, 91, 92, 93, flesh liked by the natives, 94, 171, 98, not bad in pie, 99; hunters' calls, and lures for, 99; 117,

Digitized by Google

170, best hour to shoot, 171; 172, 173, near Stockade No. 2., 191, 192, near Jelori, 263, in Lake Krawa, 298; 304; near Kau, 341, on the Ozi river, 344, 359, 408; in the Kirimanda river, 345, at M'Pekatoni Lake, 369, 370, 407, at Béré Béré Lake, 405, near Dodori, 423, 490
Hobley, C. W., his adventure with a lion, 415, 416
Hoes, 43, 57, 518; use of, not destructive of *ilook* grass, 523, 529, 552
Holechiss Lake (*called* Ziwah Holechiss,) 324, 325, 326
Holiday granted to porters, 300
Holland, and the cattle-disease, 347; importation of silk-cotton, 569
Homwé village, 434, 435, 436, 470, 471, 472, shambas of, 475, desecrated, 476; 478, 481, 493, 494
Honey, a pailful, 274; 299, 335, 338, trade in, of Wa-Galla, 466
Hooper, Rev. D., and Mrs. Hooper, C. M.S. missionaries at Jelori, 90, 91, 96, 162, 173, fugitives, 177, 178, 179, their return, 183; on native customs, 202; 241, 242, 272, 273, 274
Horse-fly, torture caused by, 199
Horses and anthrax, at Zanzibar, 349
Houses left unfinished on death of Arab builder, 525
Humidity (*see* Dewfall, Rainfall *and* Meteorology), 10; in relation to rainfall, 578, 579
Hurricane of 1872, its effects, in Zanzibar, 535, 536, 554, 564, far less severe in Pemba, 590
Hyderabad soldiers, called Viroboto, 360
Hyænas, 78, 79, totem of the Wa-Giryama, 106; 188, 453, 454
Hyphæne palms (*see* Dum palm, Fan palm, Toddy, *etc.*), distribution of, and uses, 2, 3, 78, 89, 93, 120, 126, 187, 188, 244, 298, 313, 317, 322, 325, 340, 341, 345, 350, 351, 352, 353, 354, 355, 358, 359, 360, 366, 367, 368, 369, 370, none at Fungo Zombo, 371; 373, 374, 375, in Patta Island, 380, 382, 383, 384; 391, 394, 401, 402, 404, 405, 407, 421, 425, 426, 435, 485, 498, 499, 500

I

Idio, 377
Ife fibre, 717
Ilook grass (*Imperata Koenigii*), 18, 68, two varieties of, 517; 518, not extirpated by hoeing, 523, 529, 552; 525, 526, 535, 536, injurious to cloves, 557, rare in Pemba, 595, 599, 604
Implements of agriculture (*see* Hoes, Spades, *and* Plough)
Importation of Labourers (*see* Cultivation, Labour, Slaves, *etc.*) requisite, and possible sources, 208, 209, 272, 549, 550
Imported labour (*see* Labour question), 23
Imports: makuti at Faza, 44; rice at Takaungu, 143; tobacco at Kionga, 439; pepper into Pemba, 589
Incendiarism suppressed, 53
'Inchikchi,' Swahili name for oil palms (*q. v.*), 520
India (*see* Coolies, Hindoo, Importation of Labour, *etc.*), bullock-hackeries introduced from, 347; coco-nuts, profits on, 214, coir industry in, 630, clove culture in, 735, currency employed in East Africa, 523; ground-nut culture, profits on, 213, experiments with, 259; indiarubber in, 688; inferior advantages to those of East Africa, 209; irrigation in, 225; jack-wood furniture in, 567, the rains, 253; sugar made from toddy, 214; tobacco industry, report on, 652
*India*, s.s., to Lamu, 379
Indian aspect of scenery near M'Tapa, 421
cotton for experiments, 41
cotton-plantations, wages on, 363
indigo-farms, line of work might be adapted to East African needs, 419
mortgage holders in Zanzibar and Pemba, 521, 611
police as agriculturists, 41; at Lamu, 346, 375
shops, projects for establishing, at Boma Upandi and Magarini, 264, existing, at Shimbwe, 421, at Dunga, 525
Indians (Banians, coolies, Parsees, *etc.*) in British Africa, 10, 59, 83, 85, 89, 176, 208, 209, 225, 300, 394, 421, 443
in Pemba, 589
in Zanzibar, 510, 521, 522,
Indian-corn (*see* Maize)
Indiarubber (*see* Kirk, Landolphia, Rubber, *and* Appendix D.) (*Landolphia, spp.* of *Apocynaceæ*), distribution of, and uses, 88, 89, 140, 147, 149, methods of collection, 150, 151, 159, 423; varieties of, 152; those suited



Digitized by Google

to British East Africa, 226; desirability of planting, 227, and of improving native sorts, 228; forms of manufactured, 228, 229; on the Tana, 334; of the Utwani forest, 350; of Jongeni, sent to Lamu, 375, 420; 421, 427; near Mundane Hills, 484; Waboni collectors, 486; always found where there is forest, 487; Watiku collectors, 489, 490, 492, 493; on the Dodori river, 497; at Mbweni, 546; not likely to prove remunerative in Zanzibar, 584; report on that of British East Africa, 642, of Witu, 643, extract from Spon's Encyclopædia on African rubbers, 644; sites, propagation and planting in India, 688–706
Indigo, in India, 419, in Zanzibar, 548, 574
Inland tribes and free labour, 549, 550
'Insaa,' the clove-hoe of Zanzibar, 518
Insects, plagues to man and beast (*see* Ganda-fly, Horse-fly, *and* Tsetse-fly), 22, 36, 81, 82, 170, 176, 177, 193, 194, 195, 199, 299, 304, 318, 328, 355, 356, 357, 358, 372, 383, 397, 400, 419, 432, 434, 438, 439
Insects, plagues to plants, 219, 558, 565, 566, 569, 638, 639
Intestinal worms (*Distomum*) in sheep, cured by salt-bush feed, 248
in game, caused by lack of salt, 350
Irrigation desirable, 8, 90, facilities for, on the Sabaki, 124, 126
in India, 225,
in Zanzibar, 507, 572, and Pemba, 601
Ishmaelite character of the Watoro, 242
Islamism adopted by the Chara people, 332
Itembe, 389, 390, 391, 392, insalubrious, 394, 399, 400, 401, 417, tsetse-fly at, 419, 425, 428, 429, 434, tobacco of, 439; 471, 485
Ivory, on the Tana, 334, 336; in Patta, 421, tribute paid in, 482, 487, 490
trade, 144, 466

J

JACKSON, Mr. F. J., 348
Jack trees, or Jacca (*Artocarpus integrifolia*), 40, 64, a tree resembling, 368; in Kokotoni district, 521; 530, 533, near Dunga, 540, 542, near Zanzibar, 455, 547, culture and uses, 567; grown in pepper plantations, 582; in Pemba, 594, 598
Jalicha village, 317
Jamaica, similarity between its climate and that of Zanzibar, 551, 576, cacao industry in, 580, pimento in, 582, ginger culture in, 583
Jambosa (*Eugenia jambolana*), 547
Java, silk cotton of, 569
*Java*, s.s., of the B. I. S. N., 501, 503
Jelori, rainfall at, 8, 306, road to, 86, 89, lake, 90, 203, barometrical readings at, 221, area, 91, 274, connected with the Sabaki, 92, 94, 222; mission of the C. M. S. at, 90, 98; shauri at, 97, proposed experimental garden, 97–99, 201, 209, 272, 273; slave settlement at, 121, 123, 124, rice grown at, 137; 158, country near, 166; 173, attack threatened, 177, 180, proves false alarm, 183; road to Makongeni begun, 184; registration of Watoro at, 202, delays, 241, reason of, 242; undesirable settlers near, 271, 305, 318
Jembe, or native hoe, 556
Jenner, Mr. A. C., and the lion, 415, 416
Jipe village, 405, 501
Johnston, Sir H. H., Commissioner of Nyasaland, his encouragement to scientific research, 550
Jones, Rev., Swahili clergyman, his information as to C. M. S. work, 287
Jonga shamba, 542
Jongeni, the head-quarters of Fumo Omari, 351, 352, 355, 371, 374, 375, 398, 465, 492, 493, 494, Suliman bin Abdulla at, 495, the stronghold destroyed, 501, 502
Jorori river, 44, 47
Juba river, 2, 4, navigable 5, bar at mouth of, 331; 335, 398, 399, 403, 407
*Juba*, s.s., 175, 204, 407, 415
Jubah bin Fukir, a head-man, 87, little use, 116, 122, active hindrance, 125, 128, 133, 150, 155
Jujube tree (*Zizyphus jujuba*, Lam.), in Zanzibar, 548
Jute culture proposed, 98, 236, 272; report on its cultivation in West Africa, 648

K

KALAMO, Wakamba chief, 161
Kalota river, 140
Kamba settlements, 100; dialect, 101
Kamlikeni, C. M. S. station, 100

Digitized by Google

Kandapauwa, a beetle of Ceylon, 566
Kandy, 213
Kapok (*see* Silk-cotton), 569; in Pemba, 590; report on, 648
Kau, 4, 33, inhabitants, and their trade methods, 332, water supply, 339, 340, source, 342, result of drinking, 346; temperature at, 342, location and trade, 342; 344, 345, 354, 359, 366, 367
Kauma tribe, 101, 102
Kavalli, cattle plague at, 348
Kave, Wa-Boni settlement, 486, 489
Kavirondo, cattle disease at, 348
Kavo-Kavo, village, 376
Kaya river, 100
Kaya-Giryama, 99, 100
Kaya-Kohomo, chief village of the Wa-Kohomo, 282
*Kenia*, s.s., 44
Kerosene, displacing coco-nut oil, 59; tins used to carry water, 138, prized by natives, 376
Kew Gardens Museum, specimen of Sansevieria longiflora in, 230; list of plants sent to, by Sir John Kirk, 729
'Kiapu,' a basket of cleaned cotton, 399
'Kibaba,' equivalent to one pint, 31
'Kibarua,' or hired labourers in Zanzibar, 559, and Pemba, 607
Kibwezi, 199, meteorological observations at, 657, 670, 672, 673, 674, 675
Kidichi, shamba belonging to the Sultan of Zanzibar, 519
Kidoni, 336
Kidunda Uchowi, shamba in Pemba, 597, 608
Kignamanzi, Sultan's plantation at, 535
Kijipa, 412
'Kikoka,' or creeping grass, 544
Kikokani Shamba, 544
'Kikumbe,' Swahili name for *Sans. Kirkii*, 321, 399
Kikuyu, wheat of, 653
Kilifi harbour and bay, 1, 7, 87, 145, described, its lack of good water, 146; 229, 249, 250, 251, rivers flowing into, 282; 306
Kilifi river, source and navigability, 298, hippopotami in, 304; 324, 408
Kilimandaro, 422, 425
Kilimani, coco-nuts, etc., of, 375, position, 377
Kilindini, 412
*Kilwa*, steamer of the Sultan of Zanzibar, 252, 605, seized for slaving, 610
Kimbo, 407
Kinabuni, shamba of the Sultan of Zanzibar, 507
Kinakombe, cultivation near, 335, 336, shamba, 335
Kinawi hills, 453
Kingston, Jamaica, its temperature similar to that of Zanzibar, 551
Kionga, coast aspect, 2, 394, 399, 434, 435, 437, rainfall at, 438, flies at, 438, 439, cowries, 439, 441; 442, 444, 447, 449, 462, 464, 469, 470, 471, the Wazi's anxieties, 472, water supply of, 474, 475, 481, 492, 499
Kiongawani Island, 437, pillar to commemorate slain English officer, 440
Kiongene, ridge and valley, 525
Kiongwe, rubber-trade at, 420, 421, 422, 425, 435
Kipanga river, 521
Kipini, 4, coco-nut plantations at, 344, 359; 345, 358, lions at, 360, report on the value of its cotton, 364; position, etc., 366; 376, 408
Kipungani, 407
Kira, 99
Kirimanda river, 345
Kirk, Sir John, his researches on india-rubber plants, 152, 226, 229, 230, his experimental garden at Mbweni, 272, 545, 548, 552, 567, 568, 582, Appendix F., 726, 729, German appreciation of, 730; on the diminution of rainfall at Zanzibar, 511; table of mean annual rainfall kept by, 512; quoted on the agricultural resources of Zanzibar, 547, 549, on the needs of Zanzibar, 551, on the lapse of sugar culture, 569; report by, on olive culture, 649, on fibres, 707, Sansevieria, 714; his services to botany and horticulture, 728, list of plants sent to Kew by, 729, 730
Kisanga, its good wells, 341, 344
Kisimbani, clove plantations, Pemba, belonging to the Sultan of Zanzibar, 536, 602, 603
Kisingiti, 382, 383, bad water at, 386, 390
Kisiwani, plantation, Pemba, 503, 604
Kismayu bay and harbour, 7, temperature, 10, camels of, and prices, 264; 399, 407, 415, 452, 466; meteorological observations at, 660, 669
Kisulutini, C. M. S. station, 99
Kitoka, shamba, 387
'Kitoko,' native cotton cleansing implement, 396
Kitugani, 376
Kitumbini, 344
Kiva N'gwena Wamasha Shaka, or Shaka, Tost's cotton-growing at, 360
Kizomba, 93

Digitized by Google

Kokotoni, on Zanzibar Island, coco-nut trees of, 344; 514, 516, 520, Mr. Fraser's work at, 521, 522, 569, present condition of his estate, 522, 523, 524; labour required, past, 522, and present, 524; 525, district described, 526, 527, 528, squatter labour at, 539
Kombara Bala, a rain-water pool, 445
Kombe river, 287
Kongola lake, 329
Kongoni Shamba, belonging to the Sultan of Zanzibar, 519
Konjora, 248, 249, navigable creek, 250, 251, 281, 282, 291
Korokoro, limit of navigability of the Tana, 331; 336, cultivation checked by fear, etc., 337
Koyo, harbour, near Siyu, 386, 388
Krawa, lake, game near, 296, 298, 300, 303, 321; 314, 317, temperature at, 318; 322, in the wet season, 324; 326, 'myhi' at, 395
Kudu (*A. strepsicoris*), 298
Kulesa, Swedish missionary station at, recently burnt, 333
Kunde beans (*see* Beans, *etc.*), 48, 478
Küntzel, Herr, at Utwani, 353
Kurachi, coolies from, 86
Kurwitu, 402, 412
Kwaihu, 390, 401
Kwaijama, 460
Kwale Shamba, Pemba, 604

## L

Labour question, in East Africa (*see* Agriculture, Coolies, Cultivation, Free Labour, Slaves, *etc.*), a proposed solution, 23, first attempts, 23, 24, 97, 122, 139, 190, and progress, 201, future supplies, 207, 238, 240, suggestions, 208; difficulties at Shaka, 363, forced labour, 397, 418, skilled, scarce, 419
in Zanzibar and Pemba, 524, 534, 539, 543, its importance and possible solution, 549, 550, hired labour, 559; 561, 603, 606, consequences of the difficulty, 607, 608, 610, excessive cost of slaves, 610, 611
Lamu Island, 1, 2, bay and harbour, 4, 7, rainfall at, 8, 438, temperature and humidity, 10; 12, coir rope of, 59, 214, 381, 438, palm mats of, 60; 70, 380, Guniahs of, 73, trade in orchella weed, 83, 179, 238, cotton of, its value, 259, prices given for, 394, cultivation, 418, trade, 435; bags of, 263; timber trade, 298, 331, 383, author's visit to, 310; 346; its shipping port, 351, 360, 379, slave labour from, and cost, 363, 375, 418; 364, 369, 377, 378, soil, 379, 393, 400, 401, 404, shambas, 405, sand-cliffs, 406; 407, 415, 416, 423, 472, 479, prison at, 493; 497, 499, hospital in, 501; meteorological observations at, 660, 669; the Liwali of, 428, 429, 436
Land, Giryama objection to selling, 103
Landolphia (Order *Apocynaceæ*), india-rubber vines (*see* Indiarubber *and* Rubber), 140, 149, 226, 482
*floridà*, 152
*Kirkii*, 152, 226, 229, 321, the best kind, 489, at Mbweni, 546
*owariensis*, 152
*petersiana*, 152
La Ramu lake, 369
Latuka, cattle disease in, 349
Lemon tree in Zanzibar, 568
Lentils planted, 255
Leopards, 196, 285, 365, 408, 425, 462
Liberian coffee, *see* Coffee
Limani, a rock of coral outcrop, 540, 541
Limbo-limbo fencing, 371
Limes, 34, 40, a heavy crop, 70 (cf. 547)
Limpopo river, tsetse-fly of, 357
Linseed planted, 255
Lions, at Marereni, 81, 84, on the Sabaki, 128, 187, 193, 194, 195, near M'Tondoa, 248, near the shambas, 277, 278, 295; 296, near Lake Krawa, 299, 304, baboons mistaken for, 306; near Kipini, 360, 365, near Wange, 403, 404; said to fear wild dogs, 412; Hobley's narrow escape from, 415, 416; near M'Gini, 500; in Patta, 392
Litchi, in Zanzibar, 547
Liver-fluke, or *Distomum*, preventive food against, 248
Liverpool opinion of Kipini cotton, 364
Liwalis, their justice distrusted by the Wa-Giryama, 202; their public spirit, 209, 300
Lizard, the, in Giryama folklore, 107
Lobengula, 347
Locusts, plague of, 638
Logi hill, 187, 188, 191
Logwood (*Hæmatoxylon campechianum*), well-suited for culture in Zanzibar, 548, its drawback, 574
London Missionary Society's station at Ribe, 285

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Lugard, Capt. F. D., his Stockades, 86, 121, 123, his scheme for dealing with runaway slaves, 121, his route along the Sabaki, 125, his road and camp in Giryama, 133; on the n'konge aloe, 230, on the cattle disease, 347, 348
Lung diseases, human, 43, 54, 57, 238, 382, 389
Lung-sickness (*see also* Anthrax, *and* Cattle disease), 347, 348

M

MABOGI village, 383
Mabruke, 242, his wife's death attributed to witchcraft, 243, 244
'Mabungu' or 'Matonga' fruit, 303, 304
Macdonald, Capt. J. R. L., R.E., commanding Railway Survey, his hospitality, 199, 200, his porters caught, 202; he returns to Uganda, 286
Machako's, on the Uganda road, 194, 195, meteorological observations at, 661, 664
Machamah (*see* Metamah)
Machinery not required in Sansevieria manufacture, 235
Machone, Sultan's plantation, 536
'Machowi,' a name for a wizard, 243
Mackinnon, Dr., on the cattle disease, 348
Madagascar, cattle of, 574
'Madango,' Wanika name for a kind of Sansevieria, 321
Madras, export of ground-nuts, 572, Government cinchona plantation, 227, masulah boats, 400
'Madre de Cacao,' a shade-tree, 580
Mafia, population of, 509
Magarini, rainfall at, 8, temperature, 10, Suliman bin Abdulla's shambas at, 14, 15, condition of, 21, plants under cultivation, 22, 24, soil, 24, 361, appearance of people, 26, 27, water supply, 27, head-quarters on hill, 35, temperature, 36; diseases, etc., at, 43; 77, salt supply, 78; 90, path from Jelori, 92; 131, 145, affairs at, 157, 176, 179, 203, progress of the cotton experiment at, 210, and other plantations, 238, Wanika desire to settle near, 238; Mr. Weaver as assistant, 252, 255, 264, the cotton at, 257, Giryama interest in experimental cultivation at, 259; Indian shops desired for, 264; route to Jelori, 271, 273, proposed centre for experimental culture, 278, 287; a triumphal return, 292; lions near, 295; 306; entire charge given to Mr. Weaver, 309; 411, 412, report of broker on copra, 632, report by Mr. Weaver on coco-nut cultivation at, 633, on cotton cultivation at, 637, 638, 639; meteorological observations at, 660, 670
Magidon tribe, 177
Mahawa, a head-man, 44
Mahogany (*Swietenia mahogani*), 545, 548
Maize (*Zea mais*), 15, 57, 59, 60, 90, 92, 93, 94, 117, 122, 123, 127, 136, 137, 138, 143, 144, 149, 162, 166, 185, 193, grown in swamps, 322, 323, prolific, 327; 328, 329, 330, 332, 334, 335, 337, 343, 345, 354, 363, 369, 421, 435, 437; in Zanzibar, 519, 523, 533, 548, 549, 572; report on that of British East Africa, 648
Makandas, or mat bags, material, capacity and cost, 313, 353, 380, 381, for clove-packing, 560
'Makoche' or 'Makome' (*see* Dum palm)
Makomani village, 376
Makombagni, 369
Makonde or Makenda village, 412
Makongeni runaway-slave settlement, 69, 86, roads to, 118, 165, 169, 192, 318; stockade at, 121, temperature at, and near, 125, 192, 194; 129, 131, rice of, 137, distance from Arbagundi, 166, 183, stores, 184, 185, 195; delights of, 193, 194; 199, 200, height above sea-level, 221; the Sabaki at, 222; 241, 271
Makowe, 377, 378, ferry, 405, village, 406, 501
Makumba, 500
'Makumbwa,' a variety of cycad, 89
Makundu ridge, 458
Makungo Wazin, village, 44
Makupa ferry, 286
'Makuti,' coco-nut thatch, 380
Malabar, methods of pepper culture, 583
Malacca, pineapple fibre of, uses and price, 578
Mambas, or tree cobras, *see* Snakes
Mambore village, 436, 437
Mamole district, 336
Man, his early state, according to the Wa-Giryama, 106
Manchester report on Sea Island cotton from Kipini, 364
Manda Island, 2, and bay, 7, 379
Mangabeira rubber (*Hancornia speciosa*), suitability of, to the region, 226, 227
Mangea Hill, 48, or Mount Mangea, 99, lack of water, 101, districts

Digitized by Google

near, 102, 132, 133, district of, 135; 227
Mangoes and mango-trees (*Mangifera indica*, L.), distribution and cultivation of, 18, 48, 51, 64, 87, 88, 102, 140, 142, 146, 155, 156, 204, 248, huge crop at Magarini, 306; absent beyond Mombrui, 310, 341, 345, 354, 355, 358, 359, 368, 369, 370, 371, 373, 375, 376, 377, 378, 384, 385; in Zanzibar, fine, 515, 519, 520, at Kokotoni, 521; 523, 526, 527, 528, near Dunga, 525, 530, 533, 540, 541, 542; at and near Mdo, 534, 535, 536; near Zanzibar town, 544, 545, in clove shambas, 557; cultivation of, 567; in pepper plantations, 582, 583; in Pemba Island, 590, 593, 597, 598
Mangosteen, in Zanzibar, 548
Mangrove trees (*Rhizophora spp.*) (*see* Borities), distribution of, 1, 2, 17, 78, 81, 84, 139, 149, 153; brackish soil of mangrove swamps in relation to coco-nut cultivation, 214, 219, 345, 422, 423, 425; importance of, and uses, 220, wood unattacked by white ants, 250, 251, camels useless in mangrove swamps, 313, 317; 359, 366, 367, 368, 375, 376, 377, 378, 380, 382, 387, 390, 394, 397, 401, 402, 403, 404, 421, 426, 427, 431, 435, 437; in Zanzibar, at Mbweni, 546; in Pemba Island, 596
*Manihot aipi*, *see* Cassava, sweet kind
*glaziovii*, *see* Ceará rubber
*utilissima*, *see* Cassava, bitter kind
Manilla hemp (*Musa textilis*), 220, 234, prices, 236, fibre of, prices of, 577
Manioc, *see* Cassava
Manure, natural decayed leaf, in Pemba Island, 602; use of manure in Zanzibar, 552, 557, 574
Manzai, a lovely well-watered place, 285, 288
Map of Meteorological Stations in East Africa, 637
Mapeya village, 376
Marereni, 69, 81, aspect of surroundings, 83, stockade at, 83, water supply, 84, casuarina trees of, 221, game near, 295, 296, river near, 298, orchella gatherers at, 299, 313; 300, 303, 304, 310, surface springs at, 313, distance from Mombrui, 313, from Krawe, 314, 317
Marriage customs (*see* Slaves), of the Anoka tribe, 616; of the Gallas, 337, 338; of the Giryama, 113; of the Pokomo, 333; Swahili, 243; of Wanika labourers, requiring consent of employer, 238; of the Wasania, 336
Marriage of earth and sky, Giryama belief, 103
Marseilles, trade with Zanzibar, 561, 564, 572
Masai, the, feared by the Wanika, 87, 125, and others, 195; their depredations in Giryama, etc., 100, results, 136, 318, 323, 330, 335; diet, 169; war-paths usually near water, 187, defences against, 323
Masai-land, cattle disease in, 348
Mashonaland, cattle disease in, 347
Masogoni, 405
Masud, an interpreter, 600, 608
Matabeleland, cattle disease in, 347
Matagi, 202, shamba, 244
Mathews, General Sir Lloyd, Prime-Minister to Sultan of Zanzibar, 506, 507, 514, 566, 587, 595
Matonga fruit, 303, 304
Mattaroni, head-men of, 392, 393, 394, described, 395, reports on cotton of, 396, 636; rubber gatherers of, 398, soil near, 399; 428, 429, 430, 431, 433, 435, 466, 470
Mauritius, clove culture in, 523, 732, introduced from, into Zanzibar, by the French, 553, 557; grass, 117, 119, hemp, 234, prices of, 236; in Zanzibar, 548; plants from, naturalized in Zanzibar, 507; solution of labour difficulty in, 208, 650
'Mazika' and 'Muli,' the greater and lesser rains in Zanzibar, 510
M'Bawe lake, 399, 470
'M'baya Sana' (very bad), a phrase, 470
M'Beledzoni canal (*see* Belesoni)
'Mbono' (*see* Cucurbit)
Mbweni, Sir John Kirk's experimental garden at, 271, 545, what it proves, 552; 568, 582, 585, 728
M'Dawa Island, 466
Mdo, 514, aspect of country near, 529, 533, 534, 535, 536, 537
M'Doro, a Wanika head-man, 23, 43, 44, wants higher pay, 54; 71, brings presents and wants to settle, 238
'Medicine' of the Wa-Pokomo to keep off Somalis, 335
Medicines, native love of, 169
Mehanimi, raids at, 352
Melindi, 4, rainfall, 8, 306, wind observations at, 9, temperature, 10, meteorological observations at, 659 668; 12, 13, soil and cultivation at

Digitized by Google

15 ; da Gama's pillar at, 16 ; chain gang at, 53, 69 ; trade with Muscat and Aden, 60, Swahilis of, 77, new superintendent for, 86 ; distance from Jelori, 90, 156, porters plucky, 125, an excitement at, 175, threatened attack on, 177, 178, 179, 183; Arabs hunt for runaway slaves at, 195; 199, 203 ; cultivation between Melindi and Takaungo, 204, 214, 244, tribes in district, 207 ; 247, 252, 263, transport contracts, 262 ; 271, lions near, 275 ; vile water at shambas, 292 ; game near, 295, 305, 314 ; the Tana the main route to and from, to Kamu, 331 ; 351, 412, harvest at, 478
Memorandum of number of men required on a model farm with estimate of probable rate of pay, 208, 209
Méré, coco-nut shamba at, 89, 90, height above sea-level, 221, 274
Merikano, slave settlement, 117, 119, 121, and surroundings, 332
Metamah or millet (*Sorghum vulgare*, and *Penisetum typhoideum*) (*see also* Millet), distribution and cultivation, 15, 18, export of, 60, bye-products of, 60, 142, 474 ; cultivation of, 63 ; Guniah harvest, methods, 77 ; 84, in bad condition, 146, 147 ; scarce and dear, 300, 388, 391, 395; 405, 420, 425, 431, 466, 475, 476, 477, two crops a year, 478 ; 499, 542
Metamah wa Pembe, grown by the Watiku, 477, 478
Meteorology (*see* Dewfall, Humidity, Rainfall, Temperature, *etc.*)
  Agricultural seasons, 57, 58
  Barometrical determinations of height, 221
  Climatological returns for British East Africa, extracts from, 656
  Conditions, parallel, between West Indies and Zanzibar, 576
  Meteorological observations :
    Ceylon, 579
    Chuyu, 8, 9, 101, 659
    Faza, 389
    Fiji, 579
    Fort Smith, 661, 666
    Golbanti, 325
    Greenwich, 10
    Jelori, 8, 221
    Kau, 342
    Kibwezi, 656, 657, 670, 672, 673, 674, 675
    Kionga, 438
    Kismayu, 10, 660, 669
    Lamu, 8, 10, 438 ; 660, 969
    Machako, 661, 664
    Magarini, 8, 10, 36, 660, 670
    Makongeni, 125, 192, 194, 221
    Melindi, 8, 9, 10, 659, 668
    Mombasa, 7, 8, 9, 10, 658, 665
    Mongichi, 675
    Mumia's, in Kavirondo, 670, 675
    Ndii, 668,
    Patta, 389
    Pemba, no European observations, 593
    Ras Shangani, 510, 511
    Ribe, 8
    Sabaki river, 306
    Shimoni, 667
    Siyu, 389
    Trinidad, 551, 576, 579
    Uganda, 670
    Victoria Nyanza, variations in level, 670, 676, 677
    Zanzibar, 511, 551, 576, 579
  Rainfall 7, 8, 9, 98, in connection with forest destruction, 103, of Sabaki, 119, 306, of Gambia, 227, of Jelori and Melindi, 306, of Unga, 377, near Itembe, 427, 428, of Kionga, 438; in Pemba, 510, 588, 589, 592, no European observations, 593 ; of Zanzibar, 510, 511, compared with that of Trinidad, 551, 576, in relation to humidity, 578 ; comparative tables of, 579
  Rainfall tables for East Africa, 662, 663, 669, 671
  Relative humidity, 10
  Temperatures, 9, 96, at and near Makongeni, 125, at Stockade No. 2., 191, 192, 194, at Magarini, 244, at Lake Krawa, 304, 318, at Golbanti, 325, on the Tana river, 329, at M'Pekatoni, 368, at M'Kumbi, 373, at Wange, 400 ; 404, 408, 411, 435, near Kiongwe, 422, of the wet season, 428, 429, 447, 454, at Kionga, 441, 473, near Burkau, 467, at Ras Kiambone, 469, at Homwe, 476, near Kave, 488, 490, near the Dodori, 497, near Shimbwe, 499 ; at Zanzibar, 512, 513, compared with that of Trinidad, etc., 551, 579
  Wind direction, 9
M'gini village, etc., 404, 500, 501
'Mgodoma' trees, 102
Mgoli, giant clove tree at, 590
Midges, 383, 392, 400
Mikindu palms (*Encephalartos sp.*), 599
Milimani village, 376

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Millet, Metamah, or Guinea corn (*Sorghum vulgare*, or *Penisetum typhoideum*) (*see also* Metamah *and* Guinea corn), distribution and cultivation of, 57, 59, 63, 123, 143, 149, exported, 60; 255; 328, 332, 333, 334, 359, 363, 366, 405, 421, 432, 435, 475; in Zanzibar, 542, 548, 572, 641
Mimosa, distribution of, 4, 188, 191, 310, 314, 317, 335, 336, 340, 350, 353, 374, 384, 387, 399, 433, 437, 452, 455, 457
Mitole, cultivation near, 333
Mitopalchi, mangrove swamps, Pemba, 599
Mission Boundary proposed, 271
Mission converts' behaviour in face of threatened attack, 178; civilizing influence of, 98
Mission to Uganda, 304
Missionaries, *see* Church Missionary Stations, Free Methodist, German Mission, London Missionary Society, Swedish, *etc.*
'Miwale,' Swahili name for a palm found in Pemba, 599
Mixed cultivation in clove shambas, 557
'Mjugu mawe' (Bambarra ground-nut), 543; and 'Mjugu nyassa,' 543, 572
M'Kanumbi, 351, 375, water supply, 376
M'Kauoni, Denhardt's plantations at, 417, 419, 420; 500
Mkorogo Hill, cultivation of, 542, 543
M'Kumbi, 370, 371, river, 373
M'Lango Kipungani, estuary, 378
M'lango la Siyu, hill, 307
Mlanji, experiments with fibres at, 234
M'lengo-Baya, runaway-slave settlement, 118, 119, 169, 171, 184, caravan route to, 318
Mnagana, a variety of metamah, 477
M'Narani shamba, 145, B. E. A. Co.'s custom house at, 251
Mndene, Watiku village, 431, 432, water of, 434
'Moaa,' native spade, 556
Model farm, note as to labour required and cost of wage, 208
Mohamed, head-man of Gongoni, 73, 74, 78
Mohamed Bafaro, one of Fumo Omari's leaders, 493
Mohamed bin Hussein, an Indian, made overseer at Magarini, 176, 237, results of his work, 238; his belief in witchcraft, 243, 244
Mohamed bin Jumah bin Said, an Arab cultivator in Pemba, 594, 595, 597, 599, 600, 601, on slave *versus* free labour, 602, 607, 610; 607, 608, 611
Mohamed-bin-Saif, brother of Mze Saif, 433, his home, 436, 438, he makes difficulties, 439, 440, 441, 442, 465, 466, 471, 475, 479, and the shambas, 476, 477, 478, 479, 482, 483, 484, 487, dubious followers, 493
Mohamed bin Saif, secretary to Sultan of Zanzibar, his property at Dunga, 538, on scarcity of labour, 539
Mohamed bin Saif Drumiki, overseer of the Sultan's plantations at Mdo, 534, on clove culture, 535
Mohamedanism (*see* Islamism)
Moinkanda village, 376
Moira district, 586
Moko plantain, in Zanzibar, 571
Moluccas, the habitat of the clove, 553, methods of clove culture in, 557, and of curing, 559, 562; 732, 733, 734
Mombasa Harbour, 1, and harbours, 5, 6, 7, 12, 13
Island, 6, rainfall at, 7, 8, tabulated, 9, temperature and humidity, 10, other meteorological observations, 658, 665; timber trade, 8, 153, 225, seat of administration, 86; 131, 195, 200, 242, 250, 252, Ceará rubber tree at, 225, cotton at, its value, 259, distance from Magarini, 268, Somali children from, 273, 281, return of the Survey, 282, 286; Bishop Tucker at, 285, 286, 287; 292, Nubians from, 295, Christmas at, 305; 308, 309, 378, 379, 383; the Tana river the main route to Lamu, 331; 351, within the tsetse district, 355; country to the south of, to be explored, 406; 407; start for, 412, lion hunt near, 415; 463, 501, 505, witchcraft in, 600; suitable spot for experimental culture, 730
Mombasa tribes of Portuguese descent, 114
Mombrui (*see* Ali bin Salim, the Liwali), 4, 17, 74, low hills of, 77, 84; 81, distance to Arbagundi, 166, trial of Ali bin Jumah at, 176; 214, 222, transport contracts, 264, the Liwali's proposed school for, 300; 310, surface water at, good, 313; 318, distance from Golbanti, 322
Monakombe river, 521
Money (*see* Dollar *and* Rupee, *etc.*), Galla substitutes, 337

Digitized by Google

Mongichi, meteorological observations at, 675
Mongoni creek, 401, 402, 403, 500
Monkeys, 78, 81, liking for 'Matongo' fruit, 304
Month, the Giryama, 111
Moon, the, in Giryama folklore, 111
Moorva fibre, see *Sansevieria zeylanica*
Morris, D. (Assistant Director, Kew), on cocoa culture in Jamaica, 580, on commercial fibres, 578, 719, on rubber plants, 228, on sugar culture in Jamaica, 570
Mosques, arch and ornaments of, 443
Mosquitoes, 22, 36, 82, 170, a vigorous breed, 192, 299, 304, 318, 328
Mote, a Wasania head-man, 155
Mows, or canoes of the Wa-Pokomo, 323
M'pela, village of the Bajoni, 422
M'Pekatoni, lake, 350, 357, 368, and village, 369, 387, 407
M'pengo, native name for ebony (*q. v.*)
M'Shaka, rubber of, 149, 150; 244, distance from Melindi, 247; 281, bad water of, 292; 412
M'Soma, head-man of the Watoro, 122, 123, 124, 130, 184, 185, 193, 195, 200, spokesman as to terms for complete freedom, 201, his good conduct, 202, 241, 242
M'sufi,' *see* Silk-cotton
M'Swakini, village, 432
Mtaa trees, 370
'M'Tanga neussi,' a black friable loam, 299
M'Tanganyiko, port, 99, water supply, 130, trade of, 138, Wanika settlers at, 139, 145, vegetation near, 139, suited to castor-oil plants, 229, newly acquired by the B. E. A. Co., 244, 249, accessible to dhows, 250, 288; rivers near, 291
M'Tapa, shambas at, 412
Mto Mombamba stream, 345
Mto Tana, askari station on the Tana, 331
M'Tomoni cum Wegne Akombo, shambas, 340, 341
M'Tondoa, 146, 147, 149, 244, country near, 248, 281; 291, 421
Mtori, north of the Tana river, 331
M'Toto lake, 324
Mugakha Lizard, the, and his message, 107
Muhoni river, 103
Muicarabu, 377
Muini Ku Wadunga, last 'Sultan' of Dunga, 542
Mulali, 350
Mulberry tree, Indian small variety in Zanzibar, 547, 568
'Mulungo,' name for God in Giryama, 103
Mumia's (in Kavirondo), meteorological observations at, 670, 675
Mundane Hills, 391, 398, 399, 422, 425, 427, 471, 479, 480, 484, 488, 490
Mundane Range, *see* Mundane Hills
Munga tree, 326
Murrain (*see also* Cattle disease), 213
Musama Lake, near Tana river, 329
Muscat, 60, donkeys of, and their price, 264; slave trade at, 157
Mwaeba's Hill, C. M. S. station at, 100
Mwaiba, distance from M'Tanganiko, 291
Mwana Island, residents and market at, 522
Mwangudo river and district, 102, 103
M'Wekundu, 479
Mwera river, bridged, 535, 544, district, and plantations, 543, underground course of waters, 544, alleged nutmeg culture at, 608
Mwera Korokwe river, 544
Mweru lake, tsetse-fly of, 357
Mwina, plantations of, 333
'Myhi' fruit, 395
Mze Saif, of Patta, 380, 382, 389, 390, 391, 392, interview with, 393; 397, 400, letters of introduction from, 423, 441, 446, 449, 451; he lends a guide, 429, 430, 431, 433, 436, 463, limits of his authority, 466, 470, 471, 482
Mzinga Mzinga river, 520, 521
Mzingam, uncultivated plain, 537, 542

N

NAKOA AMBARI, 41, shoots tree cobras, 173, skilful with snakes, 267, 268
Nakoa Feruzi, 41, 53, and the rain-gauge, 255
Nakoa Tofike, 70
Nakoas, or head-men of slaves, 31, accused of witchcraft, 243, 244
Narrow escape of author, 178
Nasur bin Suliman, his shambas, 33, 35, 69, inspected, 70; 72, 74, sale of his goods, 85, 86, his wife's destitution, 175, experimental cultivation on his shambas, 259
Nasur M'Baraki Jubri, elephant hunter and guide, 471, 476, 488, 479, 482, 486

Digitized by Google

Natal, example of, in use of coolie labour, 208
Native: cultivation, methods of, 18, 22, 23, 43, 69, 77, checked by lack of slaves, 32, 207
doctor engaged, 57
ignorance as to time and dates, 202
paths, characteristics of, 90, 139; Masai war-paths, 187
Staff, 41, 42
wants and work, 207
Naval Brigade's operations, 177, 353
Navigation of the Sabaki, impossible, 222, 225
N'Dau, 391, 400, 401
N'dera, 332, 333, 334
Ndii, meteorological observations at, 668
Negroid tribes, how affected by cattle disease, 348
New Orleans cotton, experiments with, 256, destroyed by rats, 260, 272
New products suitable for cultivation in Zanzibar, 576–584
New Year, Arab and Swahili festivities, 14, 415
New York, import of Clove-stalks from Zanzibar, 560
New Zealand Hemp, prices for, 236
Ngao, 327, 328, 329, 332, 345
Ngatana, Pokomo village, 333
Ngoa, a false alarmist, 177, 183
Ngozi language, 113
Nguana, 334, 335
Niambwe village, 474, 476
Night, silence of, in Africa, 36, 118
N'konge aloes, called also 'Omodo' (*see* Aloes, *and* Fibre-producing plants, *etc.*), 93, 123, 188, 194, 230, 274, 327, 398, 399
Northern Giryama, and districts, 101, 102
Nubians from Equatoria, as labourers, 295
Nutmeg-tree (*Myristica moschata*), groves of, in Central Africa, proving its suitability, 229; experiments with, 255; in Zanzibar, 548, suited to culture in Zanzibar, 581, 608; not cultivated in Pemba, 589, only one tree there, 608
Nyari, 99
Nyasaland, cattle disease in, 348, tsetse-fly in, 357; success of coffee plantations in, 550, 628
Nyika, tribe and language, 101, locale, 103
N'Zovini, or N'Zovoni, river, 139, 250, 282, 288, 291

O

Oak (*see* Casuarina *or* she-oak, *and* Silky oak), a dwarf tree resembling, 460
Oda-boro-rova, scenery near, 336
Oil grain, cultivation of, 204
Oil palms (*Elæis guineensis*), 298, in Pemba, 590, 597, 600; in Zanzibar (*called* Inchikichi), 520, 548
Oil plants of Zanzibar, 548
Olive culture desirable, 272. report on, by Sir John Kirk, 649
Oman, Arabs of, in Zanzibar, 510
Omar bin Abed, estate agent, 71, 86
Omari bin Issa, head-man of Siyu, 386, 388, 420
Omari Madi, 350, 351, 352, 353, 354, 365
'Omodo,' native name for 'n'konge' aloe, 327
Oranges, 34, 40, 64, 70, 102, trees, 285; in Zanzibar, 517, 521, 526, 528, 543, 547, cultivation of, 568; in Pemba, 590, 598
Orchella weed (*Rocella tinctoria* and *Rocella tricifórmis*), distribution, collection, and use, 69, 83, 85, 188, 300, 313, 411, 455; in Zanzibar, 548, 574; report on, 649
Ornamental painting of the Wa-Pokomo, 324
Ornaments of the Wa-Boni, 451, of the Wa-Galla, 337, 338, of the Wa-Pokomo, 334
Ostrich feathers, report on, 650
Ostriches near Kilifi, 298, 299
Ozi river, navigable, 4, 381, hippopotami, etc., in, 341, 344, 359, 408; waters of, 339, 342, is tidal, 344; its affluents, 345; 366, bar at mouth, 367

P

Pah antelope (*Neotragus*), 393
Palmyra palms, toddy from, 3
Pangani, 230, 351
Papain, its source and value, 569
Papaw tree (*Carica papaya*, L.), distribution and cultivation, 64, 103, 133, 144, 250, 285, 333, 370; in Zanzibar, 547, its uses, 569
Para rubber (*Hevea brasiliensis*), suited for experimental culture, 149, 171, near the Sabaki river, 226, 229, in Zanzibar, 548, notes on its cultivation, etc., 678
Parsees in Zanzibar, etc., 510
Passion fruit (*Grenadilla*), 547

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Patta Island, or Pate (*see* Mze Saif, *etc.*), 2, 7, 12, inhabitants, 73, 381, 386, visited by author, 379, 383, industries, 381, 385, hemp of, 384, historical references, 386, 387, 388; 404, suited to coco-nut cultivation, 419; tobacco of, 439
Paza, *see* Faza
Pear (*see* Avocada Pear), 548
Peas (*see* Baazi, Congo pea, *etc.*) (*Cajanus indicus*), 517, 518, 523, 535, 548
Pemba Island, spice, etc., of, 13, 41, 88, slave-trade and slavery at, 157, abolished, and results, 549, 550, 609, 610, 611; 244, 252, cuttings from, 255; population of, 509; rains in, 510; plants of, 548; importance of export trade in cloves, 553, 554, cloves of, compared with those of Zanzibar, 559; table of exports, 560; clove culture, 561, 587–595, 600, 601, 606, 608; tour in, its objects, 587, 588; geographical position and geological formation of the island, 588; coco-nuts on, 593, 594, 597, 598, mangoes, 593, 594, jack trees, 594, general cultivation, 596-605, nutmeg cultivation, 608, copra manufacture, 608
Pemba dwarf coco-nut tree, 88, 149, 565
Penang, clove-drying in, 559, 562
*Penisetum typhoideum*, *see* Millet
Pepper vine (*Piper nigrum*), 41, suitable soil for, 68
Pepper: (A. *Capsicum annuum*, *fastigiatum*, and *frutescens*), cultivated in Zanzibar, 539, 540, 572, 573; (B. *Piper nigrum*), probably suitable for Zanzibar, 582, Malabar methods of growing, 582, 583; not cultivated in Pemba, 589, but might be, 609
Persian colonists in East Africa, their descendants, 386, 443, encaustic tiles of, 443, their year, 113
*Philomel*, H.M.S., 304
Pice, 122
Pigott, J. R., B. E. A. Co.'s Acting Administrator, 12, 13, 414
Pillars: Vasco da Gama's Pillar, 16, Arab tomb, 437, at Ras M'Narani, 445, 467, on Kiongawana Island, 440
Pimento (*Pimenta officinalis*) at Mbweni, 546, 548, suited for cultivation in Zanzibar, 582
walking-sticks, 582
Pineapples (*Ananas sativa*) (*see* Shambas), distribution, cultivation, and uses, 63, 88, 103, 133, suitable for cultivation, 236, 291, 332, fibre-yielding, 549, suited to cultivation in Zanzibar, as fibre-plants, 578; in Malacca, 578, exported from Formosa, 578; in Pemba Island, 600, 603, 604; report on, 526
Pineapples, wild (*Bromelia*), 596
Pishi, its equivalent in lbs., in Pemba, 607
Plantains (*Musa spp.*), 34, 41, 122, 328, 329, 330, 331, 333, 334, 335, 336, 337, 369, at Mbweni, 545; the Moko kind, 571
Plants sent to Kew by Sir John Kirk, 729, 730
Pleuro-pneumonia (*see* Cattle diseases), 347, 348
Plough, unknown, 22, ryot plough should be imported, 41, 209; the first introduced, 309, Arab views on, 506
Pokomo (*see* Wa-Pokomo), district of, 207, villages 326, 329, 330, salt trade in, 331, 332, 334, 342, 346, 348
Pokomoni creek, 401, and river, 402
Pomegranates, 40, 70; in Zanzibar, 547
Poonac, a bye-product of the coco-nut, 209, 214
Population of the Coast-lands, 10
Port Durnford (*see also* Burkau), 1, 2, estuary, 4, 12, 441; harbour, 7; 12, region near to be explored, 310; 382, 406, 417, 429, 439, 441, 446, characteristic features of, 467, coco-nuts on the shore, 470
Port Kilindini, 6, 7
Port Reitz, 6, 7
Port Tudor, 6
Portal, Sir Gerald, Consul-General at Zanzibar, 295, 300, his death, 304; 505
Porters of Ayubu's caravan, run away, 200–202
Porters, difficulties with, 125, 184, 185, 193, 194, pleasant relations with, 141; their shoes, 188; 201, custom of, 296, holiday to, 300; excellent behaviour of, 411, afraid of Fumo Omari, 497, attacked by wild dogs, 498, safe home, 499, paid off, 501; well-earned praise, 502, 503
Portuguese occupations of East Africa, modern results of, 114, traces of, 360, 379, 385; in Zanzibar, 510
'Posho,' batta or food allowance, 44, 71
Prayers to the dead in Giryama, 105
Presents to the guides, 483
Prices paid for different commodities, *see* Appendix B., 624: Bananas, 59,

Digitized by Google

570, fibre of, 571; Beans, 63, 122, 143; Betel nuts, 64; Building stone, 602; Camels, 264; Cassava, 63; Cattle (draught), 213, 264; Cloves, 555, 559, 560, 561, 562; Coco-nuts, 59, 148, 523, 524, 564; Coir, 524; Copra, 260; Cotton, 259, 365; Donkeys, 17, 264; Fire-wood, 81; Fowls, 162; Gingelly oil, 361; Gunny-bags, 263; Indiarubber, 143, 152, 228, 230, *and* Appendix D., 678; Maize, 60, 122; Mangoes, 64; Oranges, 64; Orchella weed, 12, 84; Pulse, 63; Rice, 60; Sansevieria and sisal hemp, *etc.*, 234, 235, 236, 577, 721, 722; Sesame, 361; Sheep, 472; Silk cotton, 64, 226; Slaves, 28, 131, 151, 610; Sugar-cane, 63; Tobacco, 64
Principal products, 58
Pringle, Capt., of the Railway Survey, 286
Prohibition of spirituous liquors by B. E. A. Co., a substitute, 183
Public-spirited natives, 209, 300
Puff-adder (*see* Snakes), sent to England, 267, 268
Pulse (*see* Beans), 63, and *passim;* in Zanzibar, 548
Pumpkins, 123, 142, 335, 517, 523, 540, 548
Punitive expedition against Fumo Omari, 177, 353
Pythons (*see* Snakes), alleged fear of ants, 267

R

RABAI, C. M. S. station, 281, 286, hills, 287, creek and neighbourhood, 288
Rae, Dr., of the B. E. A. Co., 346, 501
Ragi, head overseer at Chueni palace, 516, 556
Raggy or wembe (*Eleusine coracana*), cultivation and distribution, 64, 65, 144, 149, 391, 405, 438; in Zanzibar, 548
Railway, direction of, 175
Railway Survey, detailed, 171, 176, 185, arrives, 199, returns, all well, 282, 286
Rain disliked by the Wanika, 67, 99, 120
Rainfall (*see* Meteorology)
Rain-gauge established at Jelori, 98, at Magarini, 255
Rain-making in Giryama, 106
Rain-tree (*Pithecolobium saman*), 247
Rain-wash, effects of, 137, 339
Ramazan, interpreter, 36, 72, 73, 82, 87, 94, 123, invaluable, 125; 128, his wife's adventures, 130, 131, 132; 133, 135, 150, 151, 166, 173, 178, his dissipation, 183; 193, on witchcraft, 244
Rambutan fruit tree (*Nephelium lappaceum*), in Zanzibar, 548
Ramie or Rhea fibre, 233, 336
Ras Garavole, 440
Ras Kiambone (*Dick's Head*), wells at, 441, 442, 469
Ras Kitua, 317
Ras M'Narani, or Cape of the Pillar, 251, 445, 467, 468
Ras N'Gomani, 78, 81, fan palm industry of, 263, 313; 304
Ras Shangani, meteorological observations at, 510, 511
Rashid, interpreter, 418, 422, 470, 479, 490, 492, 493, 494, 497
Rashid bin Kalfan, his clove shamba, 525
Rats, damage done by, 255, 256, 260, annoyance of, 297
Ravenstein, E. G., quoted, 9, on rains in East Africa, 510, 511, on temperature at Zanzibar, 513; sends reports on climatology of B. E. A., 656
Re-birth and the K'oma in Giryama, 104
Reception on estate, 277, 292
Registration of Watoro, 241, 242
Rent, how assessed by the Liwalis, 70
Reports, *see* Appendices, *also* Bibliographical Index
Réunion (*see also* Bourbon), mango seed from, 534, cloves introduced to, 553, clove culture in, 557
Revenue (*see* Exports, *etc.*), 559, 561, 567
Rhea or Ramie fibre, 236
Rhinoceros, at Marereni, 81, in the Sabaki, 188, 191, charge Mr. Foaker, 195; at Lake Krawa, 299
Rhodesia, cattle disease in, 347, 349
Ribe, meteorological observations at, 8, tribes at, 101, London Mission Station at, 285
Rice (*Oryza sativa*), distribution and cultivation, 18, 51, 58, 60, 63, 120, 122, 123, 137, 143, straw of, 209, eaten by rats, 260; 329, 330, 331, soil for, 332, 333, 334, 335, 336, none at Koro-Koro, 337; near the Utwani forest, 353, 354; 369, 391, 418, 420, 421, 425, 426, 427, as food, 430, 444, 470, cultivated, 436, by Watiku, 478, given as a

Digitized by Google

present, 491, 500; in Zanzibar, 516, 517, 518, 519, 520, soil suited for, 522, 524, 536; 526, dry culture, 527; 528, 533, 540, 571, 572; in Pemba, 594, soil suited for, 599; 601, 605; report on, in B. E. A., 650
Rise of land from sea to Stockade No. 2., 221
River system (*see* Dodori, Ozi, Sabaki, Tana, *etc.*), 4
Roads, between Melindi and the shambas, 44, 51, 73; between Mombrui and the shambas, needed, 65; road to Jelori begun, 86, 89; Anstruther's, 118; near Mangea Hill, made by Lugard, 133; 162, 165, 169; to Makongeni, 192, near the shambas, 264
Roads, need for, 89, 144, 551
Roads in Zanzibar, *etc.*, Fraser's, grown over, 522; good near the town of Zanzibar, 544; across island, 566; more required, 551
Robb, Dr. John, his meteorological observations at Zanzibar, 510, 512, views as to decrease in rainfall there, 511
Robinson, Sir W., his fibre specimens, 712
Rogers, A. S., Officer of B. E. A. Co., 346, on cattle disease, 348; 375, 406, 417, 425, 428, 429, 430, 449, 493, 501, first to enter Jongeni when taken, 512
Roka, wells of, 149, 247; 244, 248, 281, 291
Roofs of fan palm, their durability, 353, 441
of makuti, 380
Rope, *see* Coir
Rose-apple in Zanzibar, 547
Routes marched, with notes on aspect of country, soil, plant and animal life, etc.: Melindi to Magarini, 17, 18, and back, 44–48, back again, viâ Boma Upandi, 48, 49, Magarini to Gongoni, 73, Gongoni to Ras N'Gomani, 78–81, Ras N'Gomani to Marereni, 81–83, Marereni viâ Gongoni to Mombrui, 84, thence to Melindi, 85, thence to Jelori viâ Mere, 86, 88–99, Jelori to Makongeni, 116–121, up the Sabaki, 125–129, Makongeni to Takaungu viâ Fuladoyo, 130–140, thence to Kilifi, 145, 146, thence to M'Tondoa, 147, thence to Roka, 149, thence to M'Shaka, 142, thence to Aroboko, 150, thence to Melindi, 153–155, up Sabaki, North side, to intercept slave caravan, 157, to Singwaia, 161, to Arbagundi, 165, to Jelori, 173, to Melindi, 174, to No. 2. Stockade, 176, 185, along the Sabaki, 188, return to Makongeni, 191, thence to the half-way camp, 193, back to the stockade, 199, thence to Makongeni, 201, to Jelori, 202, to Melindi, 203, to Magarini, 203, to M'Tanganyika, 244–259, viâ Roka, 247, M'Tondoa, and Konjora, 248, 249, to Mombasa, 250, 251, thence back to the shambas, 277; to Mombasa by the Shire, 281–285, back through Giryama district, 286–292, to Krawa lake, 296–299, again to Krawa, 303, thence to Mombasa, 305, thence to the shambas, 306; from Mombrui to the Tana viâ Gongoni, etc., Marereni, and Lake Krawa, 310, 322, along the Tana, 323, back to Golbanti, 330, Golbanti to Witu down the Tana, 330–351, Witu to Kipini, 352–365, thence to Lamu and Patta Islands, 366–389, Patta to Lamu and Mombasa, 390–412, to Port Durnford, 415–441, in the interior, 474, and back to coast, 496, to Lamu, 501; through Zanzibar, 514, to Chueni, 515, to Kokotoni, 520, through environs, 524–526, Kokotoni to Mdo, 529, viâ Dunga, 530, 534, Mdo to the East, 535, to the South, 536, to Dunga, 537, thence through the Wahadinu district to the east, 539, to the South, 540, and back to Dunga, 541, thence to Zanzibar city, 542–545, thence to Mbweni Shamba, 545
Rubber (*see* American, Ceará, and other kinds, Landolphia, Pará rubber, *and* India-rubber), Rubber-producing trees of Central America, reported on by R. Cross, Appendix D., 696
area in B. E. A., *see* Aroboko, Utwani forest, *and* Appendix D.
trade, impulse given to, by Sir J. Kirk, 728
Rubu village, 433, water supply and cultivation of, 434, 436, 437, 442
Runaway slaves, *see* Slaves, *also* Wanika *and* Watoro
Rupee, in relation to the dollar, 523

Digitized by Google

S

SABAIA cloth, 491
Sabaki river, 4, debouchment, 17; 24, shores, 47, 48, 50, 92, tour up, 69, 86, 90, connected with Lake Jelori, 92; 93, 99, 118, swamps, 119, river-bed, 120, forests near, 120, 126, and jungle, 122; cultivation along, 123, 124, 150, proposed, 166, 201; stockades along, 121, day's expedition up, 125–129; 161, fords, 162; 176, 183, 185, march along shores of, 186, 187; in flood, 191, 192, 202, 203, floods and tide, 222, a swim in, 193; lions near, 194, 195, 277, 278, 281; 196, horse-fly along shores of, 199; capabilities of, and length, 221, suggestions for developing, ferries, irrigation facilities, 225–236, not navigable, 225, special fitness of region for rubber culture, 226, 227; 242, ferries wanted, 260, a road to, cleared, 264, 273, rainfall along, 306; native path by, 318, dum palms along, 325, Sansevieria of, 327, tsetse-fly on upper reaches, 357; 451, report on jute of, 648
Sabaki valley, 1, fertile, 3, 12, tobacco of, 15, road to open up, 89
Sacleux, Père, his map of Zanzibar, 506, 509
Sacred animals, 106
Sacrifices, animal and other, at graves, etc., in Giryama, 104, 105; 476 human, of relatives in relation to witchcraft, Mombasa, 600
Sago palms, 248
Saidapet, Madras, Government agricultural farm at, 208
Said, brother of Bwana Ahmed Bedwin, a hunter, 296, 300, 303
Said bin Hamisi, Liwali of Melindi, 14, 17, 18, his friendliness, 33, and courtesy, 36; 54, 86, 87, his plantations, 88; 123, and Nasur's wife, 175, desires seeds, 259, 277, 306
Said bin Hamisi bin Said, his plantations, 567, 599, 608
Saif bin Salim, 42
Sails of Bajoni dhows, 401
St. Vincent, clove culture in, 734
Salim or Selim, an askari (*Arab soldier*), 72, 85, 93, 98, 116, invaluable, 125, 128, 133
Salim bin Abdulla's ferry over the Sabaki ferry, 48
Salim bin Hamisi, Cadi of Dungi district, his clove shambas, 525, and hospitality, 526
Salim bin Hamisi, Liwali of Takaungu, 138, 143, 201, 202, 249, 281, 282, 291
Salim bin Saif, son of Mze Saif, 390, a nuisance, 393
Salt, obtained by evaporation, 2, deposits of, at Gongoni, 78; lack of, a cause of cattle disease, 349, 350; in low-lying valleys, 247; salt lake near Mto Tana, 331, near Witu, 346
Salt bush (*Atriplex halimoides, A. nummularia, A. reţens, A. spongiosa, A. vesicaria*), 247, 248
Salt-water process of treating india-rubber, 151, 152, 423
Salt water and coco-nuts, 219, 220, 407, 422, 425, 426, 523
Samku, lake, 467, really a series of pools, 468, 469, 470
Sansevieria (Order *Liliaceæ*) (*see* Aloes, Bowstring-hemp, Fibre-producing plants, *etc.*), 93, 102, 229; climate for, 233, compared with other fibre-producing plants, 234, 325; large-leaved, in Giryama, 288; with short, sharp-pointed leaves, 321; notes on an unidentified variety, 325; varieties near Lake Burabin, 330, near Mundane Hill, 399, near Makindu, 458, near Shamku, 467; a few kinds now lost to cultivation, 719; of Zanzibar, inferior to those of the mainland, 549; Sir John Kirk on, 714
*Sansevieria Angolensis* (of Dr. Welwitsch), 718
*bracteata*, 714
*cylindrica*, Bojer, 230, 233, value of, 234, uses, 235; 707, 711, 717, 718
*guineensis*, Willd. (*or* 'n'konge'), 230, near N'Zovoni river, 291, Wasania method of extracting fibre, 327; near the sea, 445; report on, 624, 707, 710, 711, 712, 713, 718
*Kirkii*, Baker, 230, loves shade, 318; 321, 326, 399, 710, 715
*longiflora*, Sims, 230, 233, 235, 707, 710, 713, 714
*sulcata*, 711, 718
*thyrsiflora*, 710, 715
*zeylanica*, 707, 708, 710, 711, 712, report on, 713; 715, 718
Scare-crows for hippopotami, 369
School for Arab children, planned by the Liwali of Mombrui, 300
at Ngao mission, 328
Scorpions, 184
Scotch planters desired for Zanzibar, 551

Digitized by Google

Screw-pines, 102
Sea Island cotton, experiments with, 256; successful, 259; on Tost's plantation, 361, 362, out-turn, 363, 364, broker's report on, 365; on Denhardt's estate, 401, 418 (*see* report on cotton, 634)
Sea-weed, unused, 17, 442, 448; as manure, 575
Seasons, the, in Giryama, 112
Seeds, experiments with, 255, 259
Sekoki Hill, 89, 90, 91, 92, 158, 180, 203, height above sea-level, 221; suitability for cacao planting, 229, 274
Semandato, Swahili village, 405
Semeli lake, 329
Sesame (*Sesamum indicum*), or Gingelly, *see* Sim-sim
Settlements for runaway slaves, or freed slaves, 32, 69, 86, 117, 119, 121, 130, 154, 165, 334, 486
Settlers, undesirable, near Jelori, 271, 272
Seychelles, double coco-nut of, 555
Seyd Barghash, the late Sultan of Zanzibar, 440, 471, his troops, 501, 507, his energy, 534, 569, his brothers, 535
Seyyid Ali bin Said, Sultan of Zanzibar (1892) (*see* Kilwa, Mathews, *etc.*), 14, 15, his anti-slavery decree, 22; 252, 304, claim over Patta, 387; 505, his views on ploughs, 506; 520, his shambas at Kinabuni, 507, at Chueni, 515, 516, 517, 556, 558, at Kidichi and Kongoni, 519, at Mdo, 529, 534, at Dunga, 530; a clove-planter, 558; lack of labour on his estates, 559
Shade-trees, 563, 580, 597
Shaddock, 40, in Zanzibar, 568
Shaka, or Kiva Ngwena Wamasha Shaka (*see* Tost), 360
Shakalasia, water-hole, 446, and Point, 448
Shakan, home of Bwana Siri, 399, 429, want of wells, 441; 442, 469, 470, 471
Shambas, 14, how protected, 21, care and cultivation required, 41, organization of work, 42, difficulty in disposing of produce, 300, 306
Shambas, list of those at Magarini (*see also* Magarini), 39–40
Shamba Abedi, 40, products, 63
Awalthi or Feruzi, 40, coco-nuts of, 66, 68
Baraka, 34, 36, work begun, 52, 53, 54, produce, 57, neglected, 65, but improving, 7; 252, lions near, 277
Kitanga Ke Kubwa, 40, products, 69
Kozi, 40, products and condition, 65, 67
M'Narani, 145, B. E. A. Co.'s Custom House at, 251
M'Pandiani, 35, temperature at, 36, 40, water supply at, 43, 68; the future experimental nursery, 69; 238, village amusements at, 267
M'Selm, 40, products, 69
M'Tusi, or Feressi, 40, cultivation and products, 68
Nghanima, 40, condition, 68, 264
Saraboko, 40, 68
Upandi (*see* Boma Upandi), 40
Shamku, lake, 467–470
Shark, flesh of, eaten by Guniahs, 81, and porters, 444
Sharpe, A., on cattle disease, 348
Shauri, or conference, 44, wearisome, 54, with the Wa-Giryama, 93, results, 97; with the Watoro at Makongeni, 122, 123; results, 124, a second, on opening up the Sabaki, 201; at Jelori, 273; for guides at Burkau, 450, 451; with Galla head-man, declined, 463
Shea, Sir Ambrose, impetus given by, to sisal culture, 577
'She-oak,' Australian (*see* Casuarina), 221
Sheep, salt-bush good for, 248; 435, a feed for porters, 444; as bribes, 446; of Watiku, 449, prices at Kionga, 472
Sheher and the Sheheri Arabs, mat-makers, 263; a stern husband amongst, 278
Sheik Ali bin Nasur, his clove plantation, Pemba, 602
Shella village, an old Portuguese settlement, 379
Sherwood Point (*see* Gome la Hekwa), 444
Sheya village, destroyed by the Wa-Galla, 465
Shima la Tever village, 412
Shimawongo ridge, 452
Shimbwe, grain depôt, 421; 499, 500
Shingwia, ruins of his village, 462, 465
Shinoni, meteorological observations at, 667
Shiraz tobacco seed, 418
Shire highlands, tsetse-fly of, 356
'Shortage' on cloves, 559, 560, on chillies, 573
Shwé, Island, village of the Watiku, 431, 466

Digitized by Google

Sidembe village, its bad water, 383, Island, 390
Sierra Leone, ginger culture in, 583
Sikoko wache Amadi, battle-field in Patta, 386
Silk-cotton tree, called 'Kapok' and 'Msufi' (*Eriodendron anfractuosum*), distribution, culture and uses, 64, 76, 87, 154, 220, 366, 369, 403, uses and export, 568, 569; 590, 598, report on, 648; in Zanzibar, 548, in Pemba 583
Silky oak of Queensland (*Grevillea robusta*), a shelter tree, 563, 580
Simambaya Sendeni village, 432, Island, 434
Simba or 'Lion' Hill, 317
'Simba,' an English officer killed at Kiongwana, 440
Simmonds, on coco-nut oil, 260
Sim-sim or sesame (*Sesamum indicum*), called also Gingelly, distribution, cultivation and uses, 15, 18, 50, 51, 61, 63, 84, 87, 88, 140, 143, 144, 147, 149, 361, 366, 368, 370, 377, 391, 395, 397, 405, 420, 435, 436, 466, how sown, 478; in Zanzibar, etc., 548, 572; report on, 651
Singwaia, 161, 162
Sisal hemp (*Agave rigida*) (*see* Fibre-producing plants), distribution, cultivation and uses, 234, prices for, 235, 236, 576, 721, 722, its true home, 577, article on, 577, 578; Appendix E., 719
Sisal hemp, varieties of Agave which produce it (*Agave rigida*, var. *longifolia*, or Sacqui, *Agave rigida*, var. *Sisalana*, or Yaxqui), notes on, 719
Sivatoni village, 371
Siyu, chief town of Patta Island, 383, 385, toddy of, 386; 387, 388, 389, natives hostile, 393; grain trade of, 420; 421, 422
Skins from B. E. A., report on, 651
Slaves and Slavery (*see* Imported labour *and* Labour question), in East Africa, cost of, marriage and work, 28, women, 31, privileges of, 31, 32, rights, possessions and treatment, 32; hired out, how paid, 363, 521, 534; at Chueni, 516, 517
anti-slavery decree of Sultan, 22
as bird-scarers, 475, 479
freed by B. E. A. government, 21, difficulties incurred thereby, 207, 342, 539, 543, 549; privileges of, in Zanzibar, 525, and Pemba, 557
labour of, in Pemba, 601, 602, villages of, 603; 604, scarce, 606, costly, 610
of Arabs, licence allowed to, 278, 279; of the Wa-Galla, 465; of the Watiku, 486, 487
price given for, 28, by Gallas, 131; in Pemba and Zanzibar, 610, 611
raiding of, by the Somalis, 334, methods, 335
runaway, called Watoro (*q. v.*), 119; 121, their route to Makongeni, 158; Arab hunt for, 195; slave-trading by, 131
runaway, settlements for, *see* Settlements, *supra*
trading in, by mixed caravans, 157, road followed, 158; by runaway slaves, 131; in Zanzibar and Pemba, 610
Small-pox, 242
Smith, J. Bell-, B. E. A. Co.'s officer at Melindi, 13, 17, 22, 24, 27, 28, 35, 36, 42, 54, 69, transferred to Takaungu, 86; 123, at M'Narani, 146, 252
Snakes, poisonous, at Kilifi, 146, tree cobra, or mamba (*Dendraspis*), at Arbagundi, 172, in the Christmas camp, 195, 196; at the shambas, head used for 'medicine,' 267; pythons and puff-adders, 267, 268; near Mundane Hills, 488
Snake-bite, 42, 268
Snake-handling by Nakoa Ambari, 267, 268
Sneezing, Giryama custom, 113
Snuff and hidden slaves, 610
Sohari cloth, 491
Somaliland, 12, source of the cattle disease, 23; tsetse-fly of, 357, 487
Somalis: children resent being called Galla, 273; their attack on Golbanti, 323, resisted by the Ndera men, 333, slave-raiding by, 334; are feared by the Wa-Galla, 398, 465; 403, trade in goats, 432, and cattle, 437; 449, route followed, 463; their curiosity, 438; hostility to author's expedition, 446, the reason, 452
Sop, sour and sweet, in Zanzibar, 547
*Sorghum vulgare*, *see* Guinea corn, Metamah, *and* Millet
Soudan, cattle disease likely to extend to, 348
Spade, or 'moaa,' used in Zanzibar, 556
Spice trees of Zanzibar, 548, and those suited to, 583
Spirits, belief in, in Giryama, 104, 105, 106

Digitized by Google

Spirituous liquors, prohibited by B. E. A. Co., 183
Squatter labour, 539
Stall-feeding for stock, desirable, 210
Sterile areas in Zanzibar, possible causes and cures, 508, 509
Stock, a note on, 210
Stockades at Marereni, 83; Lugard's, the first, 121; the second, 86, 174, 176, 183, road open to, 184, 185; strengthened, 191; elephants near, 194, 195, 199, 200, 203; height above sea-level, 221
Stones, flat, with circular piercings on Buramanza hill, 457
Straits Settlements, clove culture in, 736
Strategic importance of Zanzibar, 508
Suez Canal, 508
Sugar, 21, not manufactured locally, 63, made from toddy, in India, 214
Sugar-cane (*Saccharum officinarum*), cultivation of, 21, 28, 34, 36, 63, on a small scale, 220, of the Pokomo, 333, 335; cultivation and mills in Zanzibar, 516–519, at Kokotoni, 512, 522, 524, 533, 569, near Mdo, 534, 536; near Mbera river, 544, in Zanzibar town district, 548, position of the culture, 569, 570; in Jamaica, 570
Suggestions for developing the coast-lands and the Sabaki district, 204–236
Suliman bin Abdulla, the expropriated owner of the Magarini shambas, his property, 14, 18, and cultivation, 20, sugar, 21, 63; 22, 32, 35, experimental cotton cultivation, 34, 256; list of shambas, 36, 42, 50, 64, 69; 85, his ex-slaves, 122, called 'bad,' 244; his destitute sister, 175; his expressed hatred of Europeans, 495
Suliman bin Kalfan, his unfinished house, 525
Sultan or Sheik bin Mohamed bin Nasur, land-owner in Pemba, 589, 603
Sultan Khalifa, 335
Sultan Seyyid Ali, his clove plantation, 535
Sultan Seyyid Said, and his sons, 535, the introducer of rambutan, 548
Sultan of Witu, the maker of the Belazoni canal, 331
the rebel, *see* Fumo Omari
Sultans of Zanzibar (*see also* Seyyid Ali bin Said and Seyd Barghash), 535
Sumatra, clove culture in, 563, nutmeg culture, 581, silk-cotton culture, 569, tobacco culture, 48, 652, 653, tobacco seed from, 410
Suria, a, her complaint, 278
Su-siki, *see* Toddy
Swahili characteristics, 156, 328
clergyman, a, 287
of the coast, 10, 11, their New Year, 14, their agricultural methods, 18, 129, porters, 185
cultivation largely dependent on slave labour, 207, 342; usual products, 523
folklore, belief in witchcraft, 243
of Itembe, 391
justice distrusted by Wa-Giryama, 202
a, killed by crocodiles in Kilifi, 304
language, its prefixes, 85, origin, 113, and Watiki dialect of, 481
method of rice culture, 478
method of trading, 332
oppression of the Wa-Pokomo, 333, arrested by the advent of the B. E. A. Co., 342
race, its constituents, 509, not to be depended on as a source of labourers, 549; 550, sub-divisions of, 616
vanity, an instance of, 242
villages on Lake Béré Béré, 405
weapons, 382
year, 113
Swedish mission burnt at Kulesa, 333
Sweet limes, 40, in Zanzibar, 568
Sweet potatoes (*Batatas Edulis*, Lam.), 64, 92, 94, 136, 144, 332, 333, 369, 516, 517, 520, 523; in Zanzibar, 548
Symptoms of the cattle disease, 349

## T

TAITA, coffee culture started at, 730
tribe and language, 101
Takaungu, 2, 69, 86, 87, journey to, 125, 130–140, curiosity, confidence, and politeness of people, 141, situation, 141, water supply, 141, 142, population and surroundings, 142, 143, 144, products and prices, 143, trade area, 144, lawless folk, 145, wild cotton at, 147, 200, 201; 202, development of area between this place and Melindi considered, 204, 207, rubber of, 227, castor-oil, 229; 249, 287, 318, 412
Tamarind trees (*Tamarindus indicus*), distribution of, 120, 121, 188, 384, 394, 432, trees resembling, near Dodori, 424
Tamul labourers for East Africa desirable, 208, 209



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Tana river, 3, navigable, 4, up to Korokoro, 331, current in, 331, 339, 344, bar, 331, mouth, 408 and valley, 12, 207, jute culture, 236, 648, timber of, 298, exploring expedition along, 310, 314, aspect of, 322, 323, lakes near, 324–328; forest near, 328; course, winding, 329, 331; Mr. Bird-Thompson's notes on, 330–338; connected with the Ozi, 331, 339, 352; inhabitants of shores, 332, 333, floods, 334; elephants along, 336; islands in, 337; an affluent of, 340; 346, 360, 367, 451
Tanga Island, 5
Tangave, 401, 403, 404
Tea, enjoyment of, 179, 200
Tea growing at Mbweni, etc., 545, 548; over-production generally, 628
Telegraph wire at Kilifi Bay, 146
Telephone, a primitive, 77
Tembo, or Tembo la asali (*see* Toddy), its effects as an intoxicant, 285, a substitute, 300, made from honey, 335
Temperature, *see* Meteorology
Terms offered by B. E. A. Co. to the Watoro, 201
Thackeray, Miss, and Sir John Kirk's garden at Mbweni, 730
Thompson, Bird-, his notes on the exploration of the Tana river, 330; at Witu, 346; 350, 351, goes with author to the Utwani forest, 354, 355, and to Kipini, 358, farewell to, 369, 371
Tiede, Herr, cotton plantations of, at Lamu, 364, 318
Timber (*see* Borities, *also* Silky oak), floats, 225, uses, 225, 298, 331; that of white-stemmed trees unused, 352; of jack trees, 567
Time, native incapacity for realizing, 202
Tinnevelly, labourers from, for East Africa, 209
Tobacco (*Nicotiana sp.*), 13, at Melindi, 15, 16, foreign, to be introduced, 41; native, 48, 63; suitability of soil for, 48, 69; in the Giryama district, 92, 94, 97, 120, 127, 136, 138; of the Watoro, 123, 137, at Takaungu, 42, at Singwia, 162; on the Sabaki river, 196, Indian labour required for, 209; 213, experimental culture proposed, 272; 318, started by Germans, 352, 355, 360, their experiences, 418; native grown, 433, at Itembe and Patta, 439, 466, 475; used by the Wa-Pokomo, 335, 338
in Zanzibar, in the Wahadinu country, 540, 541, 573
of B. E. A. Co., reports on, 651; from the Sabaki river, 652; report on the Indian tobacco industry, 652, on tobacco from Borneo, etc., 653
Toddy, or temba, sources and uses, 3, 5, ½ slaves' allowance, 31; 41, from the dum palm, 47, 120, from coco-nuts, 59, 126, sugar made from, India, 214; its effects, used after snake-handling, 268; 285, 354, 384, toddy of Siyu, 386, 388; 432, used to make bread, 472; not made at Kokotoni, 524; its uses and names in Zanzibar, 565
Tomatoes (*Lycopersicum esculentum*), 136, 162, 332, in Zanzibar, etc., 540, 547, 573
Tondo, a Bajoni village, 432
Topi, or Senegal antelope (*Alcephalus senegalensis*), 298, 299, 303, 402
Tost, Herr, his cotton plantations at Kipini, 359–363, cost, etc., 364, 365, 368; his tobacco, 360
Totems, 106
Toyo Wabakulo, Giryama chief, interested in experimental cultivation, 259, 274
Traces of former inhabitants (*see* Portuguese), 443
Track of the cattle disease, 348
Travancore, coco-nut cultivation, 214, irrigation of, 225
Treatment of natives, 242, 467, 502
Trees in relation to rainfall, 511, 512
Trees and plants among the Wa-Giryama, 617
Trees suited to plant with cloves (*see* Coco-nuts and Mangoes), 733
Tribes of B. E. A., 516, 615
Trichinopoly districts, labour in, 209
Trinidad, banana fibre of, its value, 571; climate, etc., similar to that of Zanzibar, 576, rainfall and temperature of, 579
Tsetse-fly (*Glossina morsitans*) (*see* Ganda fly) and its congeners, localities infested by, 355–357, animals proof against, 356, effect on others, 357, remedial treatment, 357; animals partly immune, 358; 434
Tucker, Rt. Rev. A., D.D., Bishop of Uganda, 285, starts for Uganda, 286
Tula, Watiku village on island, 466

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Tumbattu Island, alleged abode of wizards, 522
Tundukwa fruit, indigenous, 395
Tundwa village, 384
Turmeric (*Curcuma longa*), in Zanzibar, 574
Turtle, 86
Twining, Lieut., R.E., of the Railway Survey, 199
Tzavo, affluent of the Sabaki, 195

U

UCHI-MEAD, 109
Uganda, 174, 200, 285, fighting in, 286, Bishop Tucker starts for, 286, Nubians from, 295, porters of, 300, Mr. Berkeley goes to, 305, cattle disease in, 348, tsetse-fly in 355, 'after-rains' in, 510, murder of Bishop Hannington near, 605; produce, report on samples, 653, report on coffee from, 654; meteorological observations (*see also* Victoria Nyanza), 679
U-Giryama, *see* Giryama country
U-kamba country, Lugard's stockades in, 121; cattle disease in, 348
Ukanga, village, 368, 407, 408
Ulcers, 43, 54
Uledi, 42
Umba river, 4
'Umbage,' or open spaces in Pemba Island, 598
'Umbwa Amitoni,' native name for wild dogs (*q. v.*), 412
'Unga' (*see* Maize), 185, 193
Unga village, 377
Universities Mission, its inheritance of the Mbweni experimental garden, 730
Unyoro, cattle disease in, 348
Uplands cotton experimented with, 361, 362, 363
Utani plantation, 604
Utwani the india-rubber forest, 350, 351, 352, 355, tsetse-fly of, 346, 358
'Uwanga,' native name for wild arrow-root, 488, 548
Uyambu village, 281

V

VAAS, Bajoni village, 125, 427
Vanilla, experimental culture of, 255, at Mbweni, 545, on Pemba Island, suited to soil, 583, 595, 609; wild, 583, 601; chiefly an aërial feeder, 602
Various samples (of produce) brought home by the Mombasa-Uganda Railway Survey, and reported on, 653
Vegetable-marrow in Zanzibar, 548
Vegetables of the coast-lands, 64; of Zanzibar, 548
Vegetation of the district explored, coast, 2, inland, 3, upland, 4
Vegetation and sterility, areas of, in Zanzibar, 509, luxuriance of, 515, near Kokotoni, 528, and in Pemba Island, 589
Victoria Nyanza (lake), 174; variation in its level, tables of, 670, 675, 676
Vine, poor yield of, in Zanzibar, 547
Viroboto, or Hyderabad soldiers, 360
Voi river, 282
Vundene, 431, 432, water of, 434

W

WAANDA, or Wangwa, small barren stretches in Zanzibar, 509, aspect of, 527, cultivation and nature of ground, 540, 543; Wangwa a Dunga, 542, Kitowoni, 540, 541
Waboni district, 12, 478, 479, tribe, appearance and occupations, 335, 336, 337, marriage customs, ornaments, drinks and weapons, 337, 338; also dress 481; their cultivation, 398, said not to exist, 423, 486, fruit liked by, 425, trade with Rubu, 435; shauri with, 451, gifts to head-man, 452, he brings his people, 481, and a guide, 482, 484, present to, 483; road, 485; in fear of the Watiku, 486, 495, whom they serve, 489, limits of their wanderings, 487, their villages, 489, 490, 497; in dread of Fumo Omari, 491, 495; the guide, 494, a malingerer, 496, fresh guides, 497, paid off, 499
Wacho, 99
Wachoni tribe, 162; are friendly, 180
Wa-Digo tribe, *see* Digo
Wa-Druma, slaves of the Watiku, 487
Wages, of askaris, 87, of labourers, 27, 54, 91, of porters, high, 34, 44, 71, 87, 184, 185, of overseers, etc., 41, 42, paid by Tost, 363; to the naossa, of dhow, to Port Durnford, 439; in Zanzibar and Pemba, 524; paid under Mr. Fraser, at Kokotoni, 522; in clove culture at Zanzibar, 559, in Pemba, 606, 607
Wa-Gibana tribe, 288
Wahadinu, or aborigines of Zanzibar, 510, or freed slaves, 525, locale of, and characteristics, 539, their cultivation, 540, 541, 573
Wahuma, decimated in consequence of cattle disease, 348

Digitized by Google

Wakahoma tribe, 162, friendly, 180, locale, 282
Wa-Kamba tribe, settlements, 100, 164, dialect, 101, 164, characteristics and cultivation, 162, alliance with, 180, selling cattle, 195, raids of, 337
Wa-Katwa tribe, 177, a branch of the Watiku, 465, 471, slaves of the Watiku, 487
Wake, Capt., Second in Command of the Sultan's troops, 510, wounded in attack on Jongeni, 502
Wakefield, Rev. Thomas, meteorological observations by, 8
Wa-Kohomo tribe, their chief village, 282
Waloroloro tribe, 337
Wandamunio village, 377
Wanga port, 5
Wange, 393, 400, Denhardt's plantations at, 401; 402, 403, 416, 417, cotton of, 419, trade of, 420, 500
Wanika, the, and cultivation, 23, their district unexplored, 24, aspect of country, 44, 47; engaged as labourers, 27, 43, 53, characteristics, 66; the wage question, 54, 91, desire to clear bush for themselves, 54, 238, improve as workers, 57, 69, their willingness, 67, 72, their dislike for rain, 67, sternness answers with, 67, 68, employed as porters, 72, their friendliness and usefulness, 116, slight trouble with, 125, slave trading by, 131; lack of water, 134; 155, off-shoots of, 161; are agriculturists, 207, take readily to cotton culture, 210, 237, 238, consider author as court of appeal, 238; shauri concerning desire to settle, 238; successfully enlisted as labourers, 241, and satisfactory, 259, 264; a village of, 285; converts, 287; the one difficulty in employing them, 639
Wapembe, aborigines of Pemba Island, as hired labourers, 606
Wa-Pokomo (*see also* Pokomo), a tribe of fishers and hunters, 323, 324, 325, 337, their crops 327; mission to, 328; the makers of the Belesoni canal, 331; religion and characteristics, 332; slaves of the Kau Swahali, 332; distribution of, along the Tana, 333; appearance, manners and customs, 332, 334, government, ornaments, weapons, etc., 334; tyrannized over by the Somalis, 335; tastes of, 335; no cattle kept, 335, limits of localization, 336, position in relation to other tribes, 342, 352, 403; trade in salt, 346
Warkono, native camping-ground, 455
Wasania tribe, and hippo hunting, 99, 173; weapons, 99, 173; guides of, 116, 119; hunters, 127, 155, their huts, dress and ornaments, 155; 177, 183, 191, their tobacco, 196, fruit liked by, 304, method of extracting fibre, 327; probably same stock as Waboni, 336
Wasin harbour, 5
Wassein, 406, 415
Wa-Teita, slaves of the Watiku, 487
Water: back-waters forming salt-pans, 2, 78; full of fish, 82; usual method of obtaining, 144
Water-ways, 1, 4
Water and water supply, general scarcity of water in Africa, 27, 314, 318, 321, 444, inconveniences consequent thereon, 458, 469; its badness, 35; in Giryama, 100, 103, 'medicine' for, 101; swamp water, 118, 131, sufferings from lack of, 132, 134, scarce at Kilifi, 146, bad at M'Shaka, 247, 292, good at Manzai, 285, C. M. S. reservoir at Rabai, 207; sand springs, 313; at Mattaroni, 394, effect on Ozi river water of floods of the Tana, 339, 344; graveyard supply at Kau, 342, effects of drinking, 346; good near Utwani, 358, good at Shaka, 360, good at M'Pekatoni lake, 369, swamp sources at Bomani, 370, and Fungo Zombo, 371; good at Sivatoni, 371, pool supply of, at M'Kanumbi, 376, good at Kilimani, 377, doubtful at Faza, 389, surface springs at Itembe, 391, good at Béré Béré lake, 405, Tana water good at low tide, 408, plentiful near Wange, 419, poor at Rubu, 434, Kionga dependent on Ras Kiambone, 441, at Kombara Bala, 445, brackish at Shakalasia, 446, plentiful near Buramanza, 456, plentiful at Shamku, 468, and Mbawe, 470, dried up at Gome la Hekwa, 468, no real scarcity along coast, 470, water supply of Zanzibar, 507, 513, of the Chueni district, 517, of Kokotoni district, 527, of Machone, 536, of Dunga, 539, of Jumbvi, 543
Water-buck (*Kobus ellypsiprymnus*), 191, 195, 298, 393, 403, 468

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Water-lily seeds collected, 119, 127
Watiku (*see* Bajoni, Burkau, *etc.*), of Patta, 382; 422, of Itembe, 427, 429; villages, 431, 449, ruined, 462, 465; 486, of Kionga, 437; 444, a friendly warning from, 449, opposition to the expedition, 464, 479, their dread of Gallas, 465, distribution and decay of the tribe, 466; road by coast, 468, guides, unreliable, 471, more procured, 478, 479, shamba customs, 476; agricultural methods, 477, 478; 480, their craftiness and domination, 482, 487, decayed cultivation, 485, large slave-owners, 487, their rubber-collecting methods, 489, information given by, on the Dodori river, 490; limits of influence, 491, 493; in league with Fumo Omari, 495, 497
Watoro, or runaway slaves, 119, cultivation by, 120, 121, 123; Lugard's scheme for their complete emancipation, 121, shauris with, 122, 123, population, 124; good workers, 124, ignorance of the upper Sabaki, doubtful, 126, 165, used as scouts, 169, trouble with, as porters, 184, and concerning wages, 184, 185, en route, 186, 187, 188, 192, 193; good workmen, 190, but noisy, 191; shauri with, on opening up Sabaki district, 201, registration of, 202, 241, delay and cause, 241, 242; idea abandoned, 271, and why, 272
Wa-Siyu or Wa-Patta, 385, alleged origin, 386; 397, 421, 422
Weapons (*see* Arrows, *and* Bows and Arrows), Arab, 282; Bajoni, 382; Galla, 129, 131, 177, 336, 338, 465; Giryama, 180; Waboni, 337, 481; Wa-Pokomo, 334; Wasania, 99, 173; Watiku, 481
Weaver, J., 13, road-making, 86, 89, progresses, 174, 176, 177, nearly shoots author, 178, 179, 180, 183, more road-making, 184, 185, 192, road completed, 195, 272; he breaks down, 199, 203, appointed assistant at Magarini, 252, takes charge, 255; does good work there, 256, 295, likes the Wanika, 259, his report on, 259, 260, 264; goes to Mombasa, 308, is left in sole charge of the shambas, 309, 411, 412, invalided to Zanzibar, 506; his report on the coco-nut cultivation at Magarini, 633, on cotton cultivation, 637, 638
Weights and measures:
Frasila, 263, 264
Gisla, 60
Kiapu, 399
Kibaba, 31
Pishi in Pemba, 607, in Zanzibar, 559
Welcome to Magarini, 292
Wells, protection of, 67, 74; stone, at Takaungu, 142, 151, with bucket and pulley, 144; at Roka, 149; at Aroboko, 154; deepened on the shambas, 306; sinking desirable, 313, 314; at Kisanga, 341, 344, at Shaka, 390, at Sivatoni, 371, at Kilimani, 377, bad at Kisingitini, 383; at Siyu, 385; wells in river-bed at Homwe, 436; at Ras Kiambone, 344
Weruni, or veld-land of Giryama, 99, districts in, 100
West Indies, solution of labour difficulty in, 550, parallels of temperature etc., with those of Zanzibar, 551, 552
clove culture in, 732
coffee exported from, 628
sisal hemp in, 576, 577
sugar culture in, 570
Wet weather joys, 166, 169, 179, 193, 427, 488
Weti, 252, and its Liwali, 587, his views on copra, 608; described, 588, environs inspected, 589-591, rainfall, 593, cultivation near, 595, 596-605, clove culture and labour difficulty, 607
Wheat of B. E. Africa, report on, 653
Wheeled traffic, needed, 89, one form introduced, 347
Wild-fowl, duck, 44, geese, 127
Wild pigs, numerous in the Wahadinu country, 539, 541, dangerous to indiarubber, 571
Wilson, D., B. E. A. Co.'s officer at Melindi, 157, 169, 171, 179, 277
Wimbe (*see* Raggy)
Wind-belts, value of, 563
Winds, prevailing, 9
Wiori river, 464
Witchcraft and wizardry, in Giryama, 106; at Mombasa, 600; in Tumbattu Island, 522; of the Wahadinu, 539; among the Watoro, 243, 244
Witu (*see* Fumo Omari), fertile, 5, wind observations at, 9, humidity, 10, 12, Indian police at, 41; people threaten Jelori, 179, 180, 188, a false alarm, 183; raids by people of, 332; exploration of district, 300, 314, 318, aspect of environs, 345, 350, 352, 353, 355, 358, 375, British

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take over the protectorate, 535, tsetse-fly in 356, 357; 360, 365, telegraph-line thence to Lamu, 371, to Mombasa, 378; outlet for produce of, 375, 387, 401, 501
Women (*see also* Slaves), the havoc wrought on mankind by, according to Giryama legend, 107, position of, in this race, 113; handshake of the Watoro, 124; headgear of the Wasania, 155
Worms, intestinal, in sheep, cured by salt-bush feed, 248, in game and cattle, where salt is rare, 350

Y

YABOGI village, 384
Yams, 523, in Zanzibar, 548
Year, the Giryama, 111; the Persian, 113
Yucatan, the home of Sisal hemp, 577, 719, 721

Z

ZANZIBAR, town and island (*see also* Kirk, Mbweni and Sultans), meteorological observations at, temperature, rainfall, etc., 10, 510, 511, 512, 513, 551, 552, 579; spice, etc., of, 12, 41, 255, timber trade of, 81, trade in orchella weed, 83, ten-mile slave zone, 121; copal of, 153, expedition to, starts, 244; the equivalent of the frasila at, 264; coco-nuts of, grown near the sea, 344; cattle disease as affecting, 348, 349; 379, coral lime trade, 388; 415, seat of justice, 440; 501, described, 505–513, geographical position and importance, 507, irrigation at, 507, 579; geological formation, 508; vegetation, 509, of surroundings, 515; inhabitants, 509, 539, and population, 510; water supply, 513; price of copra, 523, prices of coco-nuts at, 524; average life of clove tree in, 535, 557; 540, 543, good roads near, 554, 566, cultivation, agriculture and chief products, 547, 548, 549, labour difficulty, position of, 549, 550, fertility, 551, agricultural possibilities, soil, etc., 552, injurious methods employed by native cultivators, 552, clove cultivation in, 553, annual export of cloves, 554, 560, 561, methods of cultivation, 554–560; implements of clove culture, 556; alleged nutmeg culture, 608; price given for slaves, 610
Zanzibar 'red-heads' (*cloves*), 560; Sultans, *see* Seyd Barghash *and* Seyyid Ali bin Said; weights and measures, *see* Frasila, Pishi, *etc.*
Zebras, 81, 321, proof against tsetse-fly, 356
Zimberao tree (*Eugenia malaccensis*), distribution of, near Dunga, 540, 547, in Weti, 588, 592
Ziwah (meaning lake), 324
Ziwah la Feruzi, lake or swamp, 87
Zoological Gardens, London, puff-adder sent to, 268
Zulu myth of the origin of death, 107

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